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## **OBSERVATIONAL STUDY**

## **Study of Freight Performance Improvement Parameter and Current Models**

*Uday Shankar Jha*





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## Editorial

The world is passing through transition and the field of education is no exception. The model of traditional education has changed fundamentally in last two years. It has become essential for all of us to adapt to a newer realms of teaching-learning processes. Research activities have become crucial to reach out implementable and successful ways of educating a child. Online resources have become crucial more so as it is available in abundance. It also has presented with tons of opportunities to be tapped or leveraged for better. It is up to us – academicians and industry people, to try out the most effective model / ways so as to contribute to the society at large. SMTR strives to provide such opportunity to the researchers by helping them publish their genuine and original research works that present the changing paradigms of the society.

This issue of SMTR brings, once again, an assorted blend of papers on Finance, Marketing, HR, Economics and IT. One of the two studies in finance area is about mean index P/E Minus one sigma – an opportunity for investment in index portfolio which identifies long-term investment opportunity for index portfolio using index price earnings ratio (index P/E) considering seventeen years' data of Nifty-50 Index. Another study on financial performance analysis of selected IT companies of India evaluates the financial performance in terms of liquidity and profitability. Over the years studies have proven that use of information technology in service sector has evidently contributed in the Indian economy. In the area of marketing, this issue presents five prominent studies. A study on shoppers' opinion on ethical practices of social media marketers shows a remarkable paradigm shift in marketing from conventional to social media marketing. An empirical study on influence of factors on customers using online food delivery applications shows that sales promotional strategies have a positive impact on customer satisfaction and saving of time and convenience are key factors motivating customers to purchase food online. Analysis of the mediating effect of customer satisfaction on the relationship between service quality of CRM practices and customer loyalty in the banking sector lucidly presents insights into the domain concepts. One of the papers highlights effect of consumer attitude between brand preference and consumer satisfaction. In Agri-food sector / products, a study on the mediating role of consumer's attitude on selected brand parameters and purchase intentions are measured.

In the area of economics, a study on energy consumption and gross industrial value added linkages evidently studies the Indian manufacturing sector with an objective to statistically test the relationship between industrial output (production) and energy input at aggregate and dis-aggregate levels as a function of total fuel consumption namely coal, electricity, petroleum, and others.

A study on employee's perception on the impact of talent management practices on employee's performance in manufacturing and service companies discusses various talent management practices followed in the manufacturing and service sector companies. A study on how to leverage technology at future workplaces to humanize the multi-generational workforce highlights the presence of the gig workers and how technology is employed at various categories of employees so as to enable them to contribute to the common vision of the organization. It contains a comparative study of CPSE Guidelines and Companies Act 2013 in context of Corporate Social Responsibility and a paper on Hybrid Intelligent System for Credit Card Fraud Detection discusses presents novel co-operative neuro-fuzzy hybridization.

An observational study on Freight Performance Improvement Parameter and Current Model provide a glimpse into functioning of Indian Railways.

We hope the issue fulfills research quest of all knowledge seekers.

Best Wishes!

Team SMTR





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## Mean Index P/E Minus One Sigma – An Opportunity for Investment in Index Portfolio

Abhay Raja

### Abstract

*The principal aim of the study is identification of long-term investment opportunity for index portfolio by using index price earning ratio (index P/E). The study presents the identification of long-term investment opportunity for index portfolio. Attempts were made to study if investments made at the index levels where index P/E is less than mean index P/E minus one sigma and mean index P/E minus one and half sigma offer better investment opportunity. This strategy is based on the concept of relative grading where grades are decided based on mean and standard deviation of the batch and hence the strategy helps investors to time the market better.*

*This strategy was compared with Systematic Investments made at the beginning of every month. It was found that index P/E less than mean index P/E minus one sigma offers a sound investment opportunity, while investing at mean index P/E minus one and half sigma significantly increases standard deviation. The study was conducted by taking seventeen years' data (from January 2002 to December 2018) of Nifty-50 index.*

**Key Words:** Index P/E, Index Portfolio, Investment, Nifty 50, Portfolio Management

### INTRODUCTION

Empirical evidences on stock markets often denote contradictions. More scientific attempts are made to predict the market movements right after Maurice Kendall cited that “stock price series is wandering one” (Kendall, 1953). Fama inferred in his study about security prices already reflecting the available information with Efficient Market Hypothesis (Fama, 1970).

The author of this study acknowledges the impulsiveness of the market movements and also believes that systematic efforts can be made to identify stock price series. This paper examines the role of price earning ratio (P/E) in this direction. The underlying fact of the study inherently advocates the investment in index portfolio. In this context, this study analyzes role of index P/E in identifying long-term investment opportunity in index portfolio. Number of studies are available that advocate use of P/E to form the investment strategy. The focus of this study is to examine a formula based on Mean and Standard Deviation.

The author also agrees to the argument that one single factor cannot be sufficient to capture all financial and non-financial events take place in market and economy and hence reliance on only one factor for investment decision making can be risky. The argument in response is that since P/E ratio takes market price as numerator to the equation has the power to capture all factors well. Technical Analysts opined that the market price discounts everything and hence the use of P/E ratio as a sole tool for investment decision making is justified. Many studies also advocated the use of P/E ratio as a tool for investment decision making.

Index P/E is arrived at by dividing index value with trailing twelve months Earnings Per Share (EPS) of all index constituents. Twelve months' earnings reflect all major fundamental events that take place annually including macro-economic events like; inflation and GDP numbers, finance bill, monetary policy reviews etc., and firm specific events like; earnings announcement, dividend declaration, etc. The seventeen year time period (January 2002 to December 2018) used for the study completes entire business and economic cycle to make the findings of the study more robust. Index values for this time period discount all technical movements also. So, researcher believes index P/E can be taken as sole parameter to identify long-term investment opportunity for index portfolio.

P/E ratio as a tool for investment decision making is well researched area. The implicit aim of this study is also to time the market i.e. what level of P/E should one start investing at and what level of P/E should one start selling at. These questions are addressed by approaching the P/E ratio through the concept of relative grading where a decision making is done by using mean and standard deviation.

The following section of paper describes literature review on the study area. Next section explains research methodology undertaken for the study followed by deliberations on relationship of index and index P/E. The analysis part is explained by portfolio statistics and evaluation of portfolio performance in subsequent sections.

### LITERATURE REVIEW

Predictive ability of P/E ratio as an analytical tool is well researched. There is a strong literature support advocating P/E as an analytical tool and rejecting its authenticity on the contrary as well.

Peavy and Goodman (1983) tested the validity of P/E ratio as predictor of security returns. By controlling small firm size, infrequent trading and industry effect the study concluded P/E as a significant indicator related to security returns. They found that with increase in P/E returns decreased. They hold the view of possibility for generating excess returns by adhering to low P/E strategy.

Fuentes and Daza (1996) studied decision model in investment according to P/E ratio. They used data of thirteen years from 1980 to 1993 for the 20 Chilean stocks listed on Santiago Stock Market. They analyzed P/E by having two different models i.e. global model and individual model. They inferred P/E ratio as the central element for making a decision. They also mentioned that P/E ratio forecast through global model are good representations of reality.

Campbell and Shiller (1998) cited that valuation ratios deserve a special place among forecasting variables. Tanner (1999) suggested replacing P/E ratios with the rule of 20 (P/E ratio plus annualized inflation rate). The study used sixty years dataset and inferred better forecasting performance by R20 measure than P/E ratio. The study also advised that R20 measure can be used as a profitable asset allocation tool. The study advocates R20 measure better than P/E, but it does not deny the validity of P/E from the view point of its predictive ability. Tse (2002) applied P/E ratios and dividend yield to predict real estate stock prices. The study viewed P/E for market timing and assets allocation strategy. The study was contextualized by taking four major real estate firms of Hong Kong. The data was analyzed for nine years from 1991 to 2000. He cited that some predictability of P/E is due to mean reversion of dividend yields. The study further indicated that higher earnings and lower dividend can be an indication of sound investment opportunity or internal use.

Gill (2003) tested three different propositions with the underlying assumption that traditional value investment principles no longer drive the stock market valuations. He found that low P/E ratio as indicator does not hold good anymore. He advocated using industry specific average P/E Ratio. He also added that P/E Ratio blended with EPS growth rate produce sound indicator of company's potential value.

Estrada (2005) proposed the P/E ratio to be adjusted by growth and risk, i.e. PERG ratio. The study used the data for 100 US companies for the period of twenty seven years from 1975 to 2002. The study found that portfolio constructed by PERG outperformed the portfolios sorted by P/E ratio. This study implies the effectiveness of P/E ratio for investment strategy after adjusting the same with growth and risk.

Al-Shiab and Al-Ali (2006) based their study for 83

Jordanian companies listed on Amman Stock Exchange and analyzed them for eight years from 1996 to 2004. The study supported the importance of P/E for portfolio performance. They also highlighted exaggerated investors expectations well reflected upon P/E. The study reported that P/E information was not fully reflected in stock prices rapidly. Saville (2009) advocated that instead of using simple P/E ratio for tactical asset allocation, P/E ratio should be adjusted by consumer price inflation data. The study was contextualized in South Africa and it conferred that inflation-augmented P/E ratio is more successful in forecasting equity returns. The study also revealed that buy-hold strategy outperformed tactical assets portfolio on risk adjusted basis.

Ong, Yichen and Teh (2010) questioned high P/E ratio as indicator of coming bear market. It was an interesting study to forecast lows of stock market by using P/E against existing literature for forecasting highs of stock market. The study was based in Malaysia, Kuala Lumpur Composite Index and used data of sixteen years from 1994 to 2010. The study suggested that high P/E ratio may precede a rise in future stock performance.

Davis, Thomas and Diaz (2012) in Vanguard Research report confirmed that valuation metrics like P/E had inverse relationship with stock returns in long term. They further cited that P/E ratios have shown modest historical ability to forecast future returns. Basu and O'Shea (2014) found evidence of positive relationship between P/E ratio and following year's earnings growth. They studied stocks from Australian Securities Exchange and New Zealand Stock Exchange Main Board for the sixteen years from 1995 to 2011. They constructed equally weighted quintile portfolios for fourteen years based on P/E. They could witness strong but short-term P/E effect. They also observed higher absolute returns for low P/E stocks in comparison of high P/E stocks as well as overall market.

Arslan and Zaman (2014) coupled effect of dividend yield with P/E on stock returns. Their analysis was based on study spread through eleven years from 1998 to 2009 on 111 stocks listed on Karachi Stock Exchange. They found significant positive relationship between P/E ratio coupled and size of the firm on stock returns. They advocated a view of applying P/E as an investment criterion to earn abnormal return.

Chhaya and Nigam (2015) found evidence of statistically significant value premium in Indian stock market while studying equity portfolios of Indian stocks for the period from 2000 to 2013 formed based on price earning ratios. Mayur (2015) investigated P/E ratios as indicator of future prices. He has taken four



major indices from Bombay Stock Exchange and used VECM and VAR models for estimation. He inferred that prediction only works with blue chip firms or the firms with large market capitalization.

Lafmejani (2017) compared two portfolios formed by P/E and price to book value ratios on the stock listed on Tehran Stock Exchange from 2001 to 2008. The study concluded that there were mixed effects of sensitivity, firm size, and market liquidity on returns. According to Moghaddam and Li (2017) it is difficult to present empirical evidences for the mean-reversion of the P/E ratio and hence P/E ratio was regarded as mean-averting rather than mean-reverting.

Even though ample studies are performed to use P/E ratio as a parameter for investment decision making, the area of investment strategies through P/E ratio in index portfolio is less explored, especially in Indian context. This study is focused to timing the market through index P/E ratio by using the concept of

relative grading where a decision on grades is made based on mean and standard deviation of the batch.

## RESEARCH METHODOLOGY

The principal aim of this study is to test and validate effectiveness of index P/E as a sole parameter for investment decision making for index portfolio. The study was taken up in Indian context. The study attempts to test a formula for formulation of strategy for investment in index P/E. The researcher believes that index P/E provides a strong indication for timing the market which is an inherent objective of the study. The study was performed by using the monthly data for seventeen years from January 2002 to December 2018. The concept of relative grading is employed for the study, where different decision making points are created by adding / deducting standard deviation from mean P/E. Outcome of process is the five decision making points of Accumulate, Buy, Hold, Consolidate, and Sell as mentioned in Table 1:

Table 1 Investment decision making based on index P/E				
Criteria	Nifty P/E	Bins	Frequency	Decision
Mean index P/E <i>minus</i> $1.5\sigma$	13.44	Less than 13.44	16	Accumulate
Mean index P/E <i>minus</i> $1\sigma$	15.17	13.45 - 15.18	28	Buy
Mean index P/E	18.64	15.18-22.11	59	Hold
Mean index P/E <i>plus</i> $1\sigma$	22.11	22.11-23.83	70	Consolidate
Mean index P/E <i>plus</i> $1.5\sigma$	23.84	23.84 and more	31	Sell

This study is restricted to test the decision making points of Accumulate and Buy. By “Accumulate” the researcher implies to invest double than normal level of investment. During the study period such opportunities arose sixteen times. Similarly, twenty eight times the opportunity of “Buy” occurred. There can be extension of the study to the level of going short at the time when index P/E is higher than *mean index P/E plus one sigma*. In order to adhere to the scope of study i.e. to identify long term investment strategy for index portfolios, the possible option of short sell was not taken up.

To validate the hypothesis following three portfolios were constructed and returns were computed by assuming that the investments were hold till the end of December 2018:

1. A portfolio with monthly Systematic Investment Plan (SIP) of INR 10,000 in the starting of the month for all seventeen years.
2. A portfolio with investment of INR 10,000 in the starting of the month when, index P/E is less than *mean index P/E minus one sigma*

3. A portfolio with investment of INR 10,000 in the starting of the month when, index P/E is less than *mean index P/E minus one sigma*, and investment of INR 20,000 (double) in the starting of the month when, index P/E is less than *mean index P/E minus one and half sigma*.

The Nifty 50 index of National Stock Exchange, India (NSE) is taken to perform the study. The data were sourced through NSE's website, [www.nseindia.com](http://www.nseindia.com). 364 day RBI's (Reserve Bank of India) Treasury-bills rate which was 6.82 percent as on 1<sup>st</sup> February, 2018 was taken as risk free rate to calculate Sharpe ratio.

## RELATIONSHIP OF INDEX AND INDEX P/E

Mathematically index causes index P/E as index P/E is calculated by dividing index value with index EPS. But, the aim of this study is to test utility of index P/E for investment decision making in index i.e. analyzing the future trends of index. To satisfy this, index P/E is used as independent variable signaling future trends of index. This relationship is proven by using Granger Causality Test to examine whether index P/E causes index. The following results were observed:

**Table 2 Pairwise Granger Causality Tests**

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
Index P/E does not Granger Cause Index	203	4.27	0.02
Index does not Granger Cause Index P/E		1.16	0.32

The null hypothesis, index P/E does not cause Index is rejected with significance value of 0.02 and null hypothesis, index does not cause index P/E is failed to reject with significance value of 0.32 which means index P/E causes index. This substantiates the foundation for the study that index P/E can be used to identify investment opportunity in index portfolio.

Even though the objective of the study is not forecasting, the series were checked for stationarity and normality to check if the data is suitable for forecasting. The series were found stationary (ADF test was used). While the series index P/E was found normal and index was not normal (KS test and SW test were used).

### PORTFOLIO STATISTICS

To establish a long-term investment strategy for construction of index portfolio by using index P/E as the criterion, all the three portfolios were compared on the basis of returns, standard deviations and Sharpe ratios. Exhibit 5 represents descriptive statistics for both variables. The mean and standard deviation of index P/E were used to identify the buying opportunity for portfolio 2 and portfolio 3. The significant correlation coefficient between index and index P/E strengthens the hypothesis that index P/E can be used as a parameter for construction of index portfolios. Higher value of Durbin-Watson test suggests rejecting autocorrelation in the index.

**Table 3 Descriptive Statistics**

Table 3 Descriptive Statistics				
	Nifty P/E		Nifty	
	Statistic	Std. Error	Statistic	Std. Error
Mean	18.64	0.24	3783.69	162.21
Std. Deviation	3.47		2322.53	
Minimum	10.86		890.80	
Maximum	27.64		8956.75	
Skewness	0.10	0.17	0.38	0.17
Kurtosis	-0.53	0.34	-0.99	0.34
Durbin-Watson stat			2.01	
Correlation	0.54			
Significance	0.00 (2-tailed)			

### EVALUATION OF PORTFOLIO PERFORMANCE

Investments made in the portfolios were assumed to be held till December, 2018. As mentioned earlier, portfolio 1 consists of monthly SIP of INR 10,000 made on starting of every month. There were 204 time monthly investments in all. This makes total

investment of INR 20,40,000. Similarly investments opportunity for portfolio 2 arose forty four times to make the total investment of INR 4,40,000. And, the total investment in Portfolio 3 was INR 6,00,000 as sixteen times double investments were made (Accumulate) and twenty eight times normal investments were made (Buy).

**Table 4 Portfolio Statistics (CAGR)**

	Portfolio 1	Portfolio 2	Portfolio 3
Amount Invested (INR)	20,40,000	4,40,000	6,00,000
Corpus	69,83,362	25,67,062	34,92,703
CAGR	10.11%	15.11%	
Standard Deviation	6.11%	1.76%	
Sharpe Ratio	0.47	4.46	

As the investment was held till all seventeen years, the corpus of portfolio 1 rose to INR 69,83,362. The buy-and-hold returns were computed to compare the Compounded Annual Growth Returns (CAGR) for all three portfolios. CAGR of portfolio 1 was 10.11 percent. This return is more than risk free rate. But, in portfolio 1 standard deviation is also very high, i.e. 6.11 percent. This makes portfolio 1 very risky. Even

the Sharpe ratio for portfolio 1 is also quite lower at 0.47. When portfolio 1 is analyzed from return's perspective it is good but the risk component is also quite high which explains naïve buy and hold strategy for index portfolio by the way of SIP is not a workable idea.

Portfolio 2 and portfolio 3 are able to generate superior

returns than portfolio 1. The amount invested in portfolio 2 and 3 rose to INR 25,67,062 and INR 34,92,703 respectively with CAGR returns of 15.11 percent. The most important statistics for portfolio 2 and 3 is standard deviation which is 1.76 percent. Lower standard deviation explains lower riskiness, which is well reflected in Sharpe measure also. The Sharpe ratio for portfolio 2 and 3 is 4.46 which strongly advocates the investment strategy based on *mean index P/E minus one sigma*.

The difference between portfolio 2 and 3 is just the

amount of investment. Both target to invest in index portfolio at the same time and hold till end of the study period. The only difference is portfolio 3 invests double money sixteen times during the study period. In this context mathematically, the CAGR returns for both the portfolios are same i.e. 15.11 percent. Hence, analyzing from CAGR view point does not differentiate between portfolio 2 and 3. Table 5 presents the portfolio statistics based on mean simple returns in order to make comparison of all three portfolios easier and clearer.

Table 5 Portfolio Statistics (Mean Simple Returns)			
	Portfolio 1	Portfolio 2	Portfolio 3
Amount Invested (INR)	20,40,000	4,40,000	6,00,000
Corpus	69,83,362	25,67,062	34,92,703
Mean Simple Return	20.81%	38.73%	53.22%
Standard Deviation	16.13%	11.80%	26.64%
Sharpe Ratio	0.84	2.67	1.73

The table 5 portrays the absolute depiction of portfolio 1, 2 and 3. The mean simple returns are computed to differentiate between all portfolios on absolute basis. Portfolio 3 generated the highest mean simple returns of 53.22 percent. On the flip side, the standard deviation of mean simple returns for portfolio 3 was observed quite high at 26.64 percent. Sharpe ratio of 1.725 reflects the degree of higher risk inherent in portfolio 3. Portfolio 1 has exhibited 20.81 percent mean simple returns with higher standard deviation of 16.13 percent. The lower Sharpe ratio of 0.84 describes the nature of higher risk vis-à-vis return for portfolio 1. Portfolio 2, as expected produced mean simple returns of 38.73 percent which is more than portfolio 1 and lower than portfolio 3. The significant differentiator for portfolio 2 is lowest standard deviation of mean simple returns which is 11.80 percent. Sharpe ratio for portfolio 2 was found the highest which rates it the best. This means that the index portfolio investment strategy for buying when index P/E is less than *mean index P/E minus one sigma* is the appropriate for long-term.

## CONCLUSION

The study explains the power of index P/E to form investment strategy for index portfolio. There are clear evidences that portfolio constructed with the investment made when index P/E was less than *mean index P/E minus one sigma* marked the superior performance. The focus of the study was to identify long-term investment strategy for index portfolio so the short selling opportunities with index P/E more than *mean index P/E plus one sigma* was ignored.

The study overlooks other fundamental factors as it assumes that index P/E adequately captures majority of the factors. Following the logic that fundamental factors cannot be applied for analysis in consistently

superior manner (Fischer and Jordan, 2009) many factors impacting profoundly to the markets are not included in the study. The author advocates the rationale that index P/E adequately captures volatility of the markets. Moreover, the centre point of the study is to time the market with index P/E. This makes the outcomes of the study more feasible for implementation.

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# Study on Shoppers' Opinion on Ethical Practices of Social Media Marketers

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## Abstract

*A paradigm shift from conventional marketing to social media marketing has been observed in the contemporary time due to the proliferation and popularization of social media. This has not only set a new trend among the shoppers but also made them more inclined towards online shopping. And therefore, the marketing practices of social media marketers are such that a great number of shoppers can be allured. But, in reality, trustworthiness and honesty of social media marketers always greatly influence the shoppers' buying behaviour. So, in the era of digitalization, observing ethical practices occupies the significant place for operating any business. Thus, the researcher aimed at investigating the shoppers' perception on ethical practices of social media marketers. Relevant data were gathered from selected shoppers using structured non-disguised questionnaire containing twenty-two statements pertaining to ethical issues. The researcher made use of descriptive statistics, frequency, percent to analyze and interpret the collected data. Besides, independent sample 't' test was applied as a statistical tool to test the formulated hypotheses. The findings reveal that the means of opinions of selected male and female shoppers on selected ethical issues related social media marketing are significantly equal.*

**Key Words:** Social Media, Ethical, Marketing, Digitalization

## INTRODUCTION:

The extensive use of social media and the frequent occurrence of cybercrimes necessitate the social media marketers to maintain integrity and ethics in the business dealing. In fact, the adoption of ethical practices by the social media marketers instills confidence and trust among shoppers and avoids the fear of risk. The genuine marketing practices of social media marketers have the major impact on shoppers' buying behaviour. However, there are some social media marketers who are indulged unethical practices to get the maximum advantage of the contemporary scenario.

### Theoretical Background:

**Ethic** is the discipline dealing with what is good & bad and with moral duty and obligations. It is a set of moral principles, a theory or system of moral values ([www.merriam-webster.com/dictionary/ethic](http://www.merriam-webster.com/dictionary/ethic)). Ethics affect how people make decisions and lead their lives ([bbc.co.uk/ethics/introduction](http://bbc.co.uk/ethics/introduction)).

**Marketing ethic** is the systematic study of how moral standards are applied to marketing decisions, behaviour and institution Lackznick (2012).

**Social Media** are the online means of communication, conveyance, collaboration and cultivation among interconnected and interdependent networks of people or communities and organization enhanced by technological capabilities and mobility (Solomon and Tracey, p2).

**Social Media Marketing** is the utilization of social media technologies, channels and software to create, communicate, deliver and exchange offerings that have value for an organization's stakeholders (Solomon and Tracey, p14).

## REVIEW OF LITERATURE:

Lackznick (2012) reported certain issues namely misleading ad copy, bluffing while negotiating with long time supplier, promotion of such videos as provoke violence, spam advertisement, difficulty in redemption of rebates etc. Sharma and Baoker (2012) mentioned about cyber ethics which is nothing but the code of conduct of social media users. Furthermore, it was said that trust in cyberspace occupies the significant place. Kumar and Singh (2014) explored factors relating to the matter of ethics such as privacy policy, trust on e-marketing, personal information, privacy problem. The results indicated that personal information was highly ranked by the respondents followed by privacy policy. In the same line, it was suggested to adopt the advanced encryption technology to deal with both the issues. Dincer and Dincer (2014) recommended the evaluation of ethical practices and socially responsible marketing by the company from individual, organizational and society perspectives. Abdulnasir et al (2015) reported that consumers had a purchase decision though the firm was indulged into unethical practices. It was recommended establishing consumer protection association as well as carrying of consumer awareness programme. Brahmbhatt (2015) was of opinion that ethicality in any communication campaign, plays a significant role in portraying the good brand image. Elbeltagi and Agag (2016) developed a model of online retailing ethics consisting of five constructs namely security, privacy, non-deception, fulfilment / reliability and service recovery. Bhardwaj (2017) illustratively discussed in his conceptual paper about theories of ethics namely virtue ethics, conduct, utilitarian, hedonism and egoism. And more emphasis was put on ethics in market

research, pricing ethics, ethics in advertising and promotion. Moreover, he viewed ethical marketing as a procedure leading to customers' enthusiasm. Singla et al (2017) identified the prevailing unethical issues viz. receipt of spammed emails, privacy issue, usage of personal data, misleading and pop-up advertising, unavoidable ads and paid reviews on social media platforms etc. Gujjar and Manjunatha (n.d.) offered theoretical inputs pertaining to ethical and legal issues in e-marketing in India. Two major ethical issues were identified such as web tracking and privacy pressure. Khan (n.d.) made a suggestion in his conceptual research paper that social media users shall be encouraged to follow and exercise ethical practices. Markovic (n.d.) was of opinion that the more favourable is the customers' perception of the brand's ethicality, the higher will be the level of brand equity. And customers can easily identify the unreal and profit seeking behaviour of marketers.

#### **STATEMENT OF RESEARCH PROBLEM:**

The rise in number of unfavorable incidents such as data theft, breach of privacy code, online financial fraud, hacking of digital profile and account, misleading message, brand image fabrication, exaggeration etc., has compelled the shoppers to be more vigilant and careful. These incidents tarnish the image of both the brand and the company. And therefore, social media marketers require to observe ethical practices to develop faith in shoppers. Hence, the researcher has made a sincere attempt to carry out the study with the primary intention of understanding the opinions of shoppers on ethical practices adopted especially in social media marketing.

#### **RATIONALE OF RESEARCH STUDY:**

The incidents of online frauds and duping of shoppers have alarmed the red signal and made the shoppers to be more careful for online shopping and social media

activities. The research in hand significantly talks about shoppers' views on the ethical issues and behaviour of social media marketers. The results offer valuable insights on the said research problem and enable the marketers to revamp social media marketing policies in line with the branch of ethics and also to observe ethical practices so as to be trustworthy to shoppers and also to sustain long term relations with them.

#### **SCOPE AND COVERAGE OF RESEARCH:**

This empirical study majorly discussed the perception and opinions of shopper on ethical practices adopted by social media marketers. Besides, the research was exclusively based on Vadodara City.

#### **RESEARCH OBJECTIVES:**

To study the shoppers' perception and opinions on ethical practices of social media marketers.

#### **RESEARCH METHODOLOGY:**

The researcher has adopted a descriptive research design to accomplish the research objective. The identified population for the study was the shoppers having the knowledge of practices adopted by social media marketers. In totality, 147 representative shoppers from Vadodara city were conveniently chosen by the researcher. In order to obtain relevant data, a structured non-disguised questionnaire was drafted and administered which had two sections, the first one dealt with demographic details, types of shoppers, awareness and preference of selected shoppers while in the second section, the selected shoppers were to rate 22 statements indicating ethical practices on five points Likert scale (strongly agree to strongly disagree). All pertinent data were analyzed and rightly interpreted with the help of table, percent, frequency distribution and descriptive statistics. Besides, the formulated hypotheses were tested by applying Independent Sample 't' test.

#### **DATA ANALYSIS AND INTERPRETATION:**

**Table Number 1 Awareness and Preference for Online Shopping Portals**

Online Shopping Portals (e-Retailing Shops)	Awareness		Preference	
	Count	Percent	Count	Percent
Amazon	144	97.96	141	95.92
Flipkart	134	91.16	109	74.15
Snapdeal	106	72.11	38	25.85
Myntra	111	75.51	62	42.18
Club Factory	97	65.99	41	27.89
Big Basket	95	64.63	29	19.73
Bewakoof	59	40.13	28	19.05
Grofers	68	46.26	17	11.57
PharmEasy	56	38.10	10	6.80
e-bay	75	51.02	6	4.08
Medlife	56	38.10	6	4.08
Jumia	02	1.36	0	0
Other	01	0.68	01	0.68

The statistics given in table number one give an account on awareness and preference of selected shoppers for online shopping portals (e-Retailing shops). Majority of selected shoppers (97.96 percent) were aware of Amazon where variety of brands of various products are sold. While 91.16 percent of respondents had a knowledge about Flipkart. The percent of selected shoppers who were aware of Big Basket, Grofers, Pharma Easy, Medlife were 64.63, 46.26, 38.10 and 38.10 respectively. There were 0.68 percent of selected shoppers who were aware of other

online shopping portals viz. Shien, Nyka, Shopclub, Amway, Ajio etc. In addition, the most preferred online shopping portal is Amazon (95.92 percent) followed by Flipkart (74.15 percent). There were 42.18 percent of selected shoppers who preferred Myntra and 25.85 percent of shoppers prefer Sanpdeal. Surprisingly, for pharmaceutical brands, there were only 6.80 percent of shoppers who prefer PharmEasy while Medlife is preferred by 4.08 percent of shoppes.

**Table Number 2 Preferred Social Media to seek information about the desired brand**

<u>Social Media</u>	<u>Count</u>	<u>Percent</u>
Instagram	109	74.15
Online Shopping Portals	104	70.75
YouTube	97	65.99
Facebook	57	38.78
Review and Rating Sites	47	31.97
Blogs	32	21.77
Twitter	28	19.05
Wikis	23	15.65
Deal Sites	14	9.52

As revealed in table number two, there were 74.15 percent of selected shoppers for whom Instagram was the preferred social media to get information related to the desired brand. While 70.75 percent of shoppers rely on online shopping portals to have relevant information about any preferred brand. Besides, YouTube is also the preferred source of information for 65.99 percent shoppers. In the similar line, there were 31.97 percent of selected shoppers who prefer reviews and rating sites whereas for 15.65 percent of shoppers, Wikis was also a preferred source of information. Only 9.52 percent of selected shoppers prefer Deal Sites.

#### **Perception and Opinions of selected shoppers on Ethical Practices Adopted in Social Media Marketing:**

The majority of shoppers (54.42 percent) agreed that credible, trusted and authentic information about brands is made available on social media platforms by the marketers. There were 57.82 percent of shoppers who opined that there is no use of sensitive or disrespectful or controversial contents for promoting a brand on social media. Furthermore, 15.6 percent of respondents held strong agreement that marketers do not post fake news, research reports and misleading facts just to gain popularity on social media platform. And, there were 23.8 percent of shopper who strongly perceived that reviews and ratings given by online shoppes are available on social media after proper verification. Interestingly, 34.69 percent of selected shoppers stood neutral on statement that products shown on social media and delivered are always the same in terms of quality, features and packaging. Besides, 38.78 percent of shoppes were of opinion that shoppers are not wrongly allured on social media by the marketers. As a matter of surprise, 53.06 percent of shoppers perceive that promotion of brands by

influencers on social media platform is genuine. Similarly, there were 31.97 percent shoppers who have shown agreement that social media marketers are not indulged in an unlawful sales policy. While 29.93 percent of respondents held an opinion that there is no scope of hacking online shopper' social media account or theft of data and social media marketers take security measures and privacy standards are also maintained. Additionally, 31.97 percent of shoppers agreed to no receipt of spam messages/emails by the shoppers from the marketers on social media where 24.49 percent of respondents showed disagreement to it.

#### **Testing of Research Hypotheses**

##### **Research Hypothesis:**

**H<sub>01</sub>:** The means of opinions of selected male and female shoppers on '**Credible, trusted and authentic information about brands are made available on social media platforms by the marketers**' are the same.

**H<sub>02</sub>:** The means of opinions of selected male and female shoppers on '**Products shown on social media and delivered are always the same in terms of quality, features and packing**' are the same.

**H<sub>03</sub>:** The means of opinions of selected male and female shoppers on '**On social media, marketers promote those brands which are in the interest of consumers, society and environment**' are the same.

**H<sub>04</sub>:** The means of opinions of selected male and female shoppers on '**Social Media Marketers are not indulged in an unlawful sales policy**' are the same

**H<sub>05</sub>:** The means of opinion of selected male and female shoppers on '**No receipt of spam messages / emails by the shoppers from the marketers on social media**' are the same.



**Table Number 3 Group Statistics of Selected Ethical Issues related to Social Media Marketing**

Selected Ethical Issues	Gender	N	Mean	Std. Deviation	Std. Error Mean
Credible, trusted and authentic information about brands are made available on social media platforms by the marketers	Male	85	3.6706	.74623	.08094
	Female	62	3.6935	.71492	.09079
Products shown on social media and delivered are always the same in terms of quality, features and packing.	Male	85	3.0941	1.01914	.11054
	Female	62	3.0806	.87400	.11100
On social media, marketers promote those brands which are in the interest of consumers, society and environment.	Male	85	3.6706	1.00461	.10897
	Female	62	3.6774	.86412	.10974
Social Media Marketers are not indulged in an unlawful sales policy.	Male	85	3.2588	.94053	.10201
	Female	62	3.1290	.81951	.10408
No receipt of spam messages / emails by the shoppers from the marketers on social media	Male	85	3.1412	1.08181	.11734
	Female	62	3.1129	.94270	.11972

Table number three describes mean, standard deviation and standard error of opinions of selected male and female shoppers on selected ethical issues of social media marketing. The highest mean of opinion (3.6935) was of female shoppers on 'Credible, trusted and authentic information about brands is made

available on social media platforms by the marketers' while the lowest mean of opinion (3.0806) was also of female shoppers on 'Products shown on social media and delivered are always the same in terms of quality, features and packing'

**Table Number 4 Independent Sample 't' Test**

Hypothesis		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	T	df	Sig. * (2-tailed) p	Mean Difference
H <sub>01</sub>	Equal variances assumed	.066	.798	-.187	145	.852	-.02296
	Equal variances not assumed			-.189	134.701	.851	-.02296
H <sub>02</sub>	Equal variances assumed	2.058	.154	.084	145	.933	.01347
	Equal variances not assumed			.086	141.165	.932	.01347
H <sub>03</sub>	Equal variances assumed	2.084	.151	-.043	145	.966	-.00683
	Equal variances not assumed			-.044	141.027	.965	-.00683
H <sub>04</sub>	Equal variances assumed	2.393	.124	.872	145	.385	.12979
	Equal variances not Assumed			.891	40.403	.375	.12979
H <sub>05</sub>	Equal variances assumed	2.316	.130	.165	145	.869	.02827
	Equal variances not assumed			.169	140.399	.866	.02827
*5% of level of significance							

Table Number four presents the results of independent sample 't' test. Since corresponding p values for both the equal and the unequal variances of H<sub>01</sub> (0.852/2 = 0.426 and 0.851/2 = 0.4255), H<sub>02</sub> (0.933/2 = 0.4665 and 0.932/2 = 0.466), H<sub>03</sub> (0.966/2 = 0.483 and 0.965/2 = 0.4825), H<sub>04</sub> (0.385/2 = 0.1925 and 0.375/2 = 0.1875) and H<sub>05</sub> (0.869/2 = 0.4345 and 0.866/2 = 0.433) are greater than the assumed level of significance (0.05), the null hypotheses of the equality of means are accepted. Hence, it can be said that the means of opinions of selected male and female shoppers on selected ethical issues related to social media marketing are significantly equal and the differences in their means can be attributed to chance.

#### RECOMMENDATIONS [OR] SUGGESTIONS:

Social media Marketers should be engaged into promoting of any brand which is not in interest of

shoppers as well as the society. Most importantly, security standard and privacy should be maintained to avoid the chance of theft of shoppers' data. All the terms and conditions pertaining purchase such as payment, delivery period, exchange, replacement should be clearly mentioned on social media platform. Besides, Exaggeration and fabrication of brand image should be avoided. In case of any message that gets viral defaming the image of brand or creating an ambiguity among shoppers, social media marketers should immediately be required to issue the line of clarification on the same.

#### LIMITATIONS AND SCOPE FOR FUTURE RESEARCH:

Since the relevant data were conveniently gathered from selected shoppers of Vadodara city, the generalization of results cannot be justifiable.

Moreover, responses of selected shoppers based on hearsay and their prejudices might have affected the outcome of the research. In order to generalize and gain more insights on ethical practices with respect to social media marketing, the study should be repeated by taking larger sample size involving shoppers from across the country or major cities of Gujarat. Moreover, a research study on ethical practices in both online and offline shopping can be carried out.

#### CONCLUSION:

To recapitulate this empirical research study, the perception of shoppers towards ethical practices adopted by social media marketers is not completely one-sided. Additionally, privacy and security measures should be of a prime concern when a brand is marketed on social media platforms.

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# Energy Consumption and Gross Industrial Value Added Linkages: Evidence from Indian Manufacturing Sector

Dinkar Nayak, Justin John

## Abstract

*Energy, as input, plays a vital role in industrial production. Among other traditional factors of production, energy has a positive relationship with economic growth. Present study examines the functional linkages between energy consumption and Gross Industrial value-added (GIVA) in India for the period of 1999-2018. The study is conducted for 23 clusters of manufacturing industries. The study's main objective is to statistically test the relationship between industrial output production and energy input at aggregate and disaggregate levels as a function of total fuel consumption, coal, electricity, petroleum, and other fuels. Applying a series of techniques such as Panel Unit Root Test, Johansen's Co-integration Test, Vector Error Correction Model (VECM) and Granger Causality Test reveal both short run and long run relationships among variable under study. The short-run VECM results show short run causality running from GIVA to industrial fuel consumption, electricity consumption, and petroleum consumption, which means expanding industrial production demands for more energy inputs in the short run. In long run the result outcome of VECM showed cause and effect relationships among the variables. At the same time, the Granger Causality Test result reveals the presence of uni-directional causality from GIVA to total industrial fuel consumption, GIVA to industrial electricity consumption, GIVA to industrial petroleum consumption, and industrial coal consumption to GIVA. The intensity of a high degree of integration between GIVA and fuel consumption recommends expanding the scope of existing energy efficiency in the Indian economy.*

**Keywords:** Panel Unit-Root Test, Co-integration, Industrial Energy Input, Gross Industrial Value, Vector Error Correction Model.

JEL Classification: C01, C33, O13, and Q43

## I-Introduction

It is asserted that energy is the primary input for economic growth and the modern era's industrial progress. There are two reasons for this. First, the growth of an economy hinges on the availability of cost-effective and environmentally efficient energy sources. Second, the level of economic development has been seen to be dependent on energy consumption. In this regard, Indian industries are not an exception. In 2019, the industrial sector reported for almost 41% of total energy consumption in India. This being so, the change in energy consumption to responsive change in Gross industrial value-added can capture both the industrial sector structure and how efficiently the energy has been used in this sector.

For India, in the past few decades, the energy-G.D.P. elasticity has been greater than unity; for every 1% increase in G.D.P., the energy consumption increased by more than 1%. In contrast, industrial energy consumption elasticity has been less than unity (India's National Integrated Energy Policy 2005). It indicates that the industrial sector is relatively more efficient in the use of energy than the economy as a whole. This has been attributed to improved technology, energy use efficiency, inter-fuel substitution, modernization, upgrading technology, and Perform, Achieve & Trade (PAT). Against these facts, the Indian economy ranks third in world energy consumption, and Indian industries continue to be dependent on conventional production processes heavily reliant on energy. With the current reform initiatives like Make in India, whose principal objective is to put manufacturing at its growth model's heart. A government target of increasing the manufacturing sector's share in the gross domestic product from approximately 15 percent to 25 percent by the beginning of the next decade can be expected to a significant increase in demand for energy. Further, a continuous program involving infrastructure construction (roads and national highways) is likely to support energy demand growth. Thus, a robust dual functional relationship between industrial expansion and energy consumption can be expected in the near future.

In said context, present study attempts to analyze the energy consumption by Indian industries both at aggregate and disaggregate levels from 1999 to 2018. As the utilisation of aggregate energy data does not accommodate the intensity or extent to which a sector depends on various energy sources and as the employment of aggregate energy data may not be able to index the impact of a specific energy type on industrial production, following Yang (2000) in this study the disaggregate forms of energy are also used for the comparisons of the intensity of causal relationships. Thus, the study's primary objective is to empirically examine the relative impact of industrial production and energy consumption at both aggregated and disaggregated levels concerning oil, natural gas, and electricity.

The rest of the structure of the study is as follows. Section two presents the literature review on energy consumption and industrial value-added both at global and national levels. Whereas the third section deals with the data source and methodology, and the fourth section explains the results and discussion. Finally, the fifth section concludes the research outcomes.

## II-Literature Review

For a long time, the classical growth theories asserted that economic growth is dependent on labor and capital only. But the oil embargo of 1973-



74 and the continued rise in the energy prices challenged this thought and brought out the significant role of energy resources in the industrial production process (Pindyck, 1979). Georgescu (1972) was one of the first to emphasize energy as a critical input in manufacturing activities. According to him, optimum energy use improves efficiency and productivity. Since then, several studies were undertaken to analyze the nexus between energy input and economic output. Kraft and Kraft (1978) conducted one of the pioneering works on the causal relationship between energy input and economic growth using the time series data for the U.S economy from 1947 to 1974. He used a bivariate causality test to determine the causality between energy input and economic growth. He identified a positive relationship between G.N.P. growth and an increase in energy use. In another study, Yu and Erol (1987) studied the cause and effect relationship between energy consumption and real G.N.P. for developed countries like Canada, France, Germany, U.K, Italy, and Japan. By employing Granger and Sims test of causality methods, they found a bi-directional causality between Japan's two variables and no causal relationship between the two for the U.K and France. Whereas in Germany and Italy, increased GNP led to increased energy consumption, it was vice-versa for Canada.

Similarly, many other studies have been undertaken at global to investigate the relationship between energy consumption and industrial output & economic growth. Some of these studies like Glasure (1998), Soytaş and Sari (2003), Lee (2006), Zamani (2009) for various periods for economies such as South Korea, Singapore, Turkey, Argentina, United Nation, and Iran saw a bidirectional relationship among energy and output. These studies mostly used models such as the Engle-Granger causality test, Error Correction Model, and ARDL bound test. In contrast, other researchers like Hondroyannis et al. (2002), Lee (2006), Jorbert & Karanfil (2007), for economies such as United Kingdom, France, Sweden, Germany, U.S.A., and Turkey, found no causality between energy consumption and output. These studies have adopted models such as Engle-Granger, Granger causality test, Johnsen's multivariate co-integration technique, cointegration and vector error correction model (VECM). Whereas, few other studies such as Soytaş and Sari (2003), Lee (2006) Bradley, and Ugur (2007) for economies such as Japan, Turkey, and United States for different research periods have shown uni-directional causality between energy and output.

Apart from the above-cited studies, researchers have also endeavored to study and predict the relationship between energy consumption and India's GDP and industrial output. In one such study Ghosh (2002),

using time series data on variables such as electricity use and economic growth (per capita), witnessed that there is a long-run causality running from output to energy consumption. As opposed to this, Bhattacharya and Paul (2004) applied alternative econometric time series models such as; Engle-Granger, Granger causality test, and Johnsen's multivariate co-integration technique. They found that bi-directional causality exists between energy consumption and economic growth. Tiwari (2011) for the sample period of 1970-2007 used time-series data and came out with the result that in the long-run there is a causal relationship between GDP and energy consumption; Govindaraju and Tang (2013) for the sample period of 1965-2009 studied the linkages between coal consumption and real G.D.P. per capita, where the results indicated no long-run relationship between energy and income. Still, there is a short-run relationship between income and energy.

Vidyarthi (2013) for the period of 1971-2009 used the Johansen approach on time series data of energy consumption, real GDP, and carbon emissions, their results indicated there is a long-run linkage from energy to income, but a short-run link runs from income to energy; Abbas and Choudhary (2013) for the period of 1972-2008 found that at the aggregate level increase in GDP demanding more energy consumption both in the long-run and in the short run. Whereas at the disaggregated level, they found bidirectional causality between income and energy consumption. Bildirici and Bakirtas (2014), between 1980 and 2011, used a combination of different energy sources such as coal, natural gas, and oil consumption with Real G.D.P. by applying the ARDL model. Their results indicated bidirectional relation running from energy to output for coal and oil. Nain, Ahmad, and Kamaiah (2015), on the other hand, used time-series data at aggregate and disaggregate levels on electricity consumption and real GDP by applying ARDL bound test. Their results indicated no long-run relationship at the aggregate level, but a short-run relationship was found between energy and income.

The brief foregone survey of the literature shows no unanimity between the energy input relationship with Economic growth/industrial output. The findings of multiple studies vary at large. These differences could be accorded to different methodologies used, sets of variables, and various individual research periods. Further, the previous studies mostly covered the sample period up to 2011 and primarily used the ARDL model. The earlier studies were mainly undertaken for heavy industries such as steel, aluminum, cement, paper, etc. It is in this context that the present study aims to investigate the short term as well as the long term relationship between energy use



and industrial output using Vector Error Correction Model both at aggregate and disaggregate level, covering twenty-three clusters of industries listed in the Annual Survey of Industries.

### III-Data Source and Methodology

The study covers a period from 1999 to 2018; a cluster of 23 industries has been chosen. The necessary data were taken from the Annual Industrial Survey of India. The data includes Energy Consumption (TFC), Coal consumption (ICC), Electricity Consumption (IEC), Petroleum Consumption (IPC), other oil consumption (IOC), and Industrial Value Added (IVA). ITEC, ICC., I.E.C., I.P.C., I.O.C., and I.V.A. values are expressed at the 2011-2012 constant price. Following Chang et al. (2001) and to have stationary in the variance-covariance matrix, all the factors have been transformed into natural logs.

As the empirical evaluation of the relationship between energy consumption and Industrial value-added involves cross-section time-series data analysis, the first step is to conduct a unit root test to check the data's stationary and non-stationary data.

Along with this, optimum lag structure selection has been performed with the help of the Akaike Information Criterion (A.I.C.). The obtained lag length has been imputed in the Johansen co-integration test. Here two types of panel unit root test have been undertaken, one on the standard unit process with Levin Lin and Chu (L.L.C.) and the other of individual unit root process using Im, Pesaran, and Shin (I.P.S.), Fisher-augmented Dickey-fuller (A.D.F., 1979) and Phillips Perron test (P.P,1988). The P.P. test considers the series' heteroscedastic dimension hypothesis, while the A.D.F. test deals with autocorrelation. Based on the above tests, the order of integration of the series has been determined. After that, an attempt has been made to investigate the possibility of cointegration between variables through Johansens (1988) and Maddala& Wu (1999) tests of cointegration. Maddala and Wu (1999) used Fisher's (1932) result to propose an alternative approach to test for cointegration in panel data by combining tests from Thus, if  $\pi_i$  is the  $p$ -value from an individual cross-sections tests to obtain a test statistic for the full panel.

$$-2 \sum_{i=1}^N \log_e(\pi_i) \dots \dots \dots (1)$$

is distributed as  $\chi^2_{2N}$

The  $\chi^2$  value is based on Mackinnon -Haug -Michelis's (1999)  $p$ -value for Johansen's co-integration Trace test and Maximum Eigenvalue Test.

The evidence of co-integration has been identified through the outcome of Johansen's co-integration test. Although co-integration indicates Granger causality at least in one direction, it does not mean the direction of

causality between variables. Thus to find out the direction of the Granger causality among indicated variables, the Vector Error Correction Model (VECM) has been undertaken. To establish VECM, the differencing of the V.A.R. is performed. In the process of differencing the V.A.R., we lose a lag; hence the VECM model has been defined as follows:

At first, we consider a bi-variate relationship.

$$Y_t = \mu + \beta_1 X_t + \varepsilon_t \dots \dots \dots (2)$$

With Engle and Granger (1987) help, we try to connect the co-integration and Error Correction Model

(E.C.M.) by converting the above equation.

Hence co-integration equation between and are formulated as follows:

$$\varepsilon_t = Y_t - \mu - \beta_1 X_t \dots \dots \dots (3)$$

The Error Correction Models for  $Y_t$  and  $X_t$  are as follows:

$$\begin{aligned} \Delta giva_t = & \alpha + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{K-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \phi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} \\ & + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_1 ECT_{t-1} + u_{1t} \dots \dots \dots (4) \end{aligned}$$

$$\Delta Intifc_t = a + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_2 ECT_{t-1} + u_{2t} \dots \dots \dots (5)$$

$$\Delta Inicc_t = b + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_3 ECT_{t-1} + u_{3t} \dots \dots \dots (6)$$

$$\Delta Iniepv_t = c + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_4 ECT_{t-1} + u_{4t} \dots \dots \dots (7)$$

$$\Delta Iniofc_t = d + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_5 ECT_{t-1} + u_{5t} \dots \dots \dots (8)$$

$$\Delta Inipp_t = e + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{k-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_6 ECT_{t-1} + u_{6t} \dots \dots \dots (9)$$

k-1= the optimal lag length is reduced by 1

$\beta_1, \phi_j, \varphi_k, \vartheta_m, \theta_n$  = Short run dynamic coefficient of the model's adjustment long run equilibrium

$\gamma_i$  = the velocity of adjustment parameter with a negative sign.

$ECT_{t-1}$  = the error correction term is the lagged value of the residuals derived from the co-integrating

regression of the dependent variable on the regressors. It incorporates long run inference obtained from a long run co-integration association.

$u_{it}$  = Residuals in the equation.

Eq. (10) shows that Y's current value is associated to the past values of itself and X's past values. At the same time, Eq. (11) denotes that

$$\Delta Y_t = \sum_{i=1}^n \alpha_i \Delta Y_{t-i} + \sum_{j=1}^n \beta_j \Delta X_{t-j} + u_{1t} \dots \dots \dots (10)$$

$$\Delta X_t = \sum_{i=1}^n \alpha_i \Delta X_{t-i} + \sum_{j=1}^n \delta_j \Delta Y_{t-j} + u_{2t} \dots \dots \dots (11)$$

Eq. (10) shows that Y's current value is associated to the past values of itself and X's past values. At the same time, Eq. (11) denotes that  $\Delta X$  is associated with the past values of itself and  $\Delta Y$ . The null hypothesis in Eq.

(10) is  $\beta_j = 0$ , which says, " $\Delta X$  does not Granger cause  $\Delta Y$ ." Similarly, the null hypothesis in Eq. (11) is  $\delta_j = 0$ , and states, " $\Delta Y$  does not Granger cause  $\Delta X$ ." The rejection or non-rejection of the null hypothesis is rested on the F-statistics.

#### IV-Results and Discussion

The results are derived after performing appropriate models, as articulated above. The panel unit test, namely, Levin, Lin and Chu (2002); Im, Pesaran, and Shin (2003); and panel augmented Dickey-Fuller (A.D.F.) (Maddala and Wu, 1999) are worked out, and

the test result has been presented in the Table-1. The test result reveals that the series is integrated with I(1), which means the given series is stationary at the first difference, which means that the variables are distinctively integrated of order 1 or I(1).

Table-1, Panel Unit Root Test

Variables	Levin, Lin & Chu t*		ADF		PP	
	Level	First difference	Level	First difference	Level	First difference
GIVA	13.4	11.43*	1.047	219.07*	0.722	305.21*
PCTIFCV	16	11.23*	2.412	234.485*	1.063	286.27*
PCICCW	9.574	4.607*	0.724	58.091*	0.002	47.355*
PCIEPV	17.78	9.457*	0.817	191.34*	0.701	274.82*
PCIPPV	7.708	15.95*	2.957	306.848*	1.239	382.75*
PCIOFCV	6.499	18.64*	11.128	364.462*	5.644	431.8*

# Each test employs an intercept and not the trend. \* indicates significance level at 1%. Levin, Lin, and Chu (2002)- presumes typical unit root process, Fisher Type test using A.D.F. and P.P. Test (Maddala and Wu (1999) and Choi (2001))- presumes individual unit root process. Each A.D.F. statistic is accounted for the small time lag length, which has been selected based on the minimum Akaike Information Criterion. The Phillips-Perron test employs the identical models as the Dickey-Fuller tests, but uses a non-parametric correction, due to Newey and West (1987), to deal the potential serial correlation. We chose the lag truncation for this non-parametric correction with a help of an automated bandwidth estimator using the Bartlett kernel (Andrews 1991). The test statistics for both the Dickey-Fuller and Phillips-Perron tests have the same distributions. Critical levels are represented in Hamilton (1994) and Enders (1995).

For the cointegration test, the Hypothesis is stated as

$H_0$ =No co-integration

$H_1$ = $H_0$  is not true

The Co-integration test has been implemented on the level form of the variables and not on their first difference (Table-2).

Table-2: Johansen Fisher Panel Co-integration Test

Variables	$H_0=r$	Fisher Stat.*	Fisher Stat.*
		(from trace test)	(from max-Eigen test)
1.(IVA,TFC)	0	115.2	114.5
	1	52.76	52.76
2.(IVA,ICC)	0	83.85	82.63
	1	50.71	50.71
3.(IVA,IEC)	0	112	116
	1	41.64	41.64
4.(IVA,IOFC)	0	98.34	92.17
	1	62.88	62.88
5.(IVA,IPP)	0	114.1	103.5
	1	71.33	71.33

r -indicates the number of cointegration relationships. The critical values for maximum Eigenvalue and trace test statistics are given by Johansen and Juselius (1990)

Through the Johansen Maximum Likelihood approach (Table-2), we have investigated whether there is a long-run co-integration relationship among industrial value-added and industrial energy inputs, both at aggregate and disaggregate levels. The outcome of the Eigen value and trace tests reject the null hypothesis of no co-integration vectors. Still, they do not deny the doctrine of co-integrating vector (i.e.,

$r=1$ ) at a 5 % level of significance for models (1), (2), (3),(4), and (5).The results record that the I.V.A. and energy consumption in the industry both at aggregated and disaggregated levels are co-integrated; therefore, we can conclude that both the series tend together in the long run. It posits that the pairs of said variable series are in a long-run relationship.

Table-3: Short Run Causal Effect Revealed by the t-statistics of Error Correction Term,

			Coefficient	Std. Error	t-Statistic	Prob.
InGIVA	1	C(4)	0.118894	0.086133	1.380346	0.1676
		C(6)	0.498032	0.164476	3.027996	0.0025
		C(8)	0.024984	0.073283	0.340926	0.7332
		C(10)	-0.015811	0.0226	-0.69959	0.4843
		C(12)	-0.076841	0.050152	-1.53214	0.1256
InPCTIFCV	2	C(16)	0.18817	0.054543	3.449911	0.0006
InPCCVV	3	C(30)	0.030355	0.018355	1.653741	0.0983
InPCIEPV	4	C(44)	0.127027	0.048756	2.605331	0.0092
InPCIOFCV	5	C(58)	0.271607	0.126714	2.14347	0.0322
InPCIPPV	6	C(72)	0.271243	0.068515	3.958861	0.0001

Table-4: Long Run Causal Effect Revealed by the t-statistics of E.C.T.,

Model		Coefficient	Std. Error	t-Statistic	Prob.
InGIVA	C(1)	-0.191877	0.053712	-3.57235	0.0004
InTIFCV	C(15)	0.003308	0.002168	1.526045	0.1271
InCCV	C(29)	0.003162	0.000729	4.335113	0.000
InIEPV	C(43)	-0.004866	0.001938	-2.51135	0.0121
InIOFCV	C(57)	0.013077	0.005036	2.596854	0.0095
InIPPV	C(71)	0.00928	0.002723	3.408126	0.0007

The long-run casual relationship indicated by t-statistics of error correction term reveals a robust causal relationship between energy consumption and gross industrial value added at aggregate and disaggregate levels. The models (as shown in Table-4) InGIVA, InCC, and InIEP have a causal relationship

among the variable in the long-run. At the disaggregated level increase in gross industrial value-added has a positive impact on the demand for coal consumption and electricity consumption at a 5% significance level.

$$ECT_{t-1} = [Y_{t-1} - \phi_j X_{t-1} - \phi_k R_{t-1} \dots] \dots \dots \dots (12)$$

The co-integrating equation and long-run model are an error correction term equation signifying long run relationships among the variables.

$$ECT_{t-1} = [1.0000Ingiva_{t-1} - 0.9658Intifc_{t-1} - 7.7101Inicc_{t-1} + 3.6819Iniep_{t-1} + 0.94418Inofc_{t-1} - 4.8951Inipp_{t-1} + 68.731]$$



The above  $ECT_{t-1}$  of the co-integrating equation can be interpreted in elasticity form as a 1% change in total industrial energy consumption will increase the gross industrial value added by 0.9658 percent. Similarly, a 1% change in industrial coal consumption will influence a change in gross industrial value added by 7.710 percent. Thus coal consumption has a significant influence on gross industrial value-added.

In the same way, a percentage change in Industrial petroleum product consumption increases the gross industrial value added by 4.89 percent. On the contrary, industrial electricity and other-fuel consumption have a negative impact on the gross industrial value-added.

The Short run association among the variables is expressed below:

$$\Delta giva_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta Ingiva_{t-i} + \sum_{j=1}^{K-1} \phi_j \Delta Intifc_{t-j} + \sum_{k=1}^{k-1} \varphi_k \Delta Inicc_{t-k} + \sum_{l=1}^{k-1} \sigma_l \Delta Iniepv_{t-l} + \sum_{m=1}^{k-1} \vartheta_m \Delta Iniofc_{t-m} + \sum_{n=1}^{k-1} \theta_n \Delta Inipp_{t-n} + \gamma_1 ECT_{t-1} + u_{1t}$$

$$\Delta giva_t = -0.191877 \Delta Ingiva_{t-i} + 0.118894 \Delta Intifc_{t-j} + 0.498032 \Delta Inicc_{t-k} + 0.024984 \Delta Iniepv_{t-l} - 0.015811 \Delta Iniofc_{t-m} - 0.076841 \Delta Inipp_{t-n} + 0.003339 ECT_{t-1} + 0.069971$$

The adjustment co-efficient, which denotes that the previous period's deviation from long-run equilibrium, is corrected in the current period as an adjustment speed of 0.003339,

In the short-run (shown in Table-3), a percentage change in TIFC is associated with 0.1188 increases in GIVA on an average Ceteris Paribus, a percentage change in I.C.C. is associated with 0.49 increases in

GIVA on an average Ceteris Paribus, a percentage change in IEPV is associated with 0.0249 increase in GIVA on an average Ceteris Paribus. In contrast, a percentage change in IOFC is associated with a -0.0158 decrease in GIVA on an average Ceteris Paribus. Similarly, a percentage change in I.P.P. is associated with a -0.076 reduction in GIVA on an average Ceteris Paribus.

Granger/Wald Causality test on lagged explanatory variables

H0: lagged coefficient (s)=0

H1: lagged coefficient (s)≠0

Decision Criteria: Reject the null hypothesis if the Prob-value of the chi2 statistic is < 0.05

Table-5: V.E.C. Granger Causality, Block Exogeneity Wald Tests

Model	Variable influence	Chi-sq	Prob.
GIVA	INICCVV	14.424	0.0007
TIFCV	INGIVA	13.229	0.0013
ICCVV	INGIVA	2.8164	0.2446
IEPV	INGIVA	7.1022	0.0287
IOFCV	INGIVA	6.3978	0.0408
IPPV	INGIVA	23.063	0.000

The null hypothesis (as shown in Table-5) tells that the lagged co-efficiency of ICCV does not cause GIVA, against the alternative that the lagged co-efficient of ICCV has a causal effect on GIVA. Looking at the chi-sq results and the probability value, the obtained p-value (0.0007) being more significant than the p-value of the chi-2 statistic (<0.05), we accept that ICCV does

not have a short-run causal effect on GIVA. However, at a 10% level of significance, ICCV has short-run causality on GIVA. In contrast, GIVA has a short-run causal effect on total industrial fuel consumption, electricity consumption, petroleum consumption, and other fuel consumption at a 5% level of significance.

Pair-wise Granger causality test on the direction of causality

H0: no Granger – causality

H1: the null hypothesis is not true

Decision criteria: Reject the null hypothesis if the Prob-value of the F-statistics is  $<0.05$

To know the direction of causality

Table:6 Pair-wise Granger causality test on the direction of causality

Null Hypothesis:	F-Statistic	Prob.	Direction of causality
INTIFCV does not Granger Cause INGIVA	1.4599	0.2335	Uni-directional causality running from
INGIVA does not Granger Cause INTIFCV	6.70204	0.0014	GIVA to TIFCV
INICCVV does not Granger Cause INGIVA	10.8724	3.00E-05	Uni-directional causality running from
INGIVA does not Granger Cause INICCVV	2.30372	0.1012	I.C.C. to GIVA
INIEPV does not Granger Cause INGIVA	1.2565	0.2857	Uni-directional causality running from
INGIVA does not Granger Cause INIEPV	6.1478	0.0023	GIVA to IEC
INIOFCV does not Granger Cause INGIVA	2.42366	0.0899	No causality, independent relationship
INGIVA does not Granger Cause INIOFCV	4.7221	0.0094	
INIPPV does not Granger Cause INGIVA	2.6995	0.0684	Uni-directional causality running from
INGIVA does not Granger Cause INIPPV	8.82099	0.0002	GIVA to IPPC

### V-Conclusion and Policy Implications:

Thus present study examines the inter linkages between energy inputs and industrial value-added for Indian industries for the sample period of 1999-2018. It explores the relationship both at the aggregate and dis-aggregate levels upon finding the presence of integrated series at the level through the panel unit root test. The Johansen Maximum Likelihood approach indicated strong co-integration of the variables. The cointegration results record that the GIVA and energy input in industry both at aggregate and disaggregate levels are co-integrated, and the combination of the following series such as I.V.A. and T.F.C.; I.V.A. and I.C.C.; I.V.A. and I.E.C.; I.V.A. and IOFC; I.V.A. and I.P.P.; tending together in the long run. Hence, posits the pairs of investigated variable series are in a long-run relationship. Later, to find out the direction of the Granger causality between variables, VECM has been undertaken. In long-run, the results of VECM showed that InGIVA, InCC, and InIEC have cause and effect relationships among the variable in the long-run. At the disaggregated level, an increase in gross industrial value-added has a positive impact on the demand for coal usage and electricity consumption at a 5% significance level. These findings are similar to Akhmat and Zaman (2013) and Bildirci (2014) for coal usage and economic growth. But at the same time, the results contradict the finding of Nain, Ahmed, and

Kamaiah (2015). As their conclusion for the industrial sector at disaggregates level revealed no long run relationship between Energy and Income.

Moreover, the short-run VECM results show short-run causality running from GIVA to industrial fuel consumption, electricity consumption, and petroleum consumption, which means expanding industrial production demands for more energy inputs in the short-run. Moreover, the Granger Causality test reveals the direction of causality running from GIVA to TIFCV, GIVA to I.E.C., GIVA to IPPC, and I.C.C. to GIVA.

Based on the above empirical results, we know that the Gross industrial value-added is delivered primarily through energy consumption. The industrial sector's energy intake remains as high as 50% of the total available commercial energy. Among which coal & electricity is used as a critical component in industrial production both in the short-run and long-run. Energy-intensive manufacturing such as food, pulp & paper, basic chemicals, refining, iron & steel, nonferrous metals & nonmetallic mineral seems to be energy dependent for decades ahead. Hence the policymakers must fulfill two objectives. First, balance the demand for and supply of energy and safeguard the environment from negative externalities of excessive energy consumption. This requires a focus on industrial energy efficiency and scope for saving

energy by adopting energy-efficient technology (EETs), substitution for conventional sources of energy, renewable energy Technology (RETs), and best operating practices (B.O.P.s).

Moreover, the current Indian economic thought being "a self-reliant India" (Atmanirbhar Bharat) will double energy consumption in the near future and widen the energy deficit. Hence in time to come, India needs to design robust energy policies such as reducing dependency on fossil fuels, particularly petroleum and coal, and moving towards renewable energy sources, including hydrogen. This will make India a manufacturing hub, creating global competitiveness, and Atmanirbhar Bharat achievable.

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# Influence of Factors on Customers Using Online Food Delivery Applications: An Empirical Study

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## Abstract

*Online food delivery service providers are promptly increasing their business in India. Food delivery services are to be had in India's metro and urban cities. The robust development of internet users and technology triggered an online purchase. Customers can order food from different restaurants and have to in a specific place; food distribution apps offer a variety of foods and dishes. Consumers can find the best restaurant, quality food by viewing other consumer's online reviews and get food easily with a single click on their mobile app. The study objective is to explore the impact of sales promotional strategies with online food ordering app users, and factors affecting customer decision-making to purchase online food. The result shows that sales promotional strategies have a positive impact on customer satisfaction, and the research also indicates that time savings and convenience are key factors motivating customers to purchase food online.*

**Keywords:** *behavioral patterns, consumer decision making, discounts, online food delivery applications, premium, zomato.*

## 1 Introduction

Digital technology growth has reshaped the way companies do business (Xu & Huang, 2019). Technology development is helping more people engage in digital business. Even consumers are purchasing or ordering food online quickly and conveniently through apps or websites, and anticipate the same service from the outlet itself. To fulfil the needs of the consumer, mobile-based meal ordering applications must provide quality services to consumers with improved facilities (Yusra & Agus, 2020). Consumers can also use the Internet for a range of purposes, like learning, communicating, banking, shopping, and even ordering food online. With such benefits, the Internet is becoming increasingly the main communication tool, and an easy business operation. Mobile apps have helped increase customer choice, because their technological reliance has encouraged customers to do everything digitally, such as ordering meals served at the door, such as ordering meals served at the door (Doub, Levin, Heath, & Le Vangie, 2015). Information technology plays a significant role in moving the food distribution system from physical work to digital order fulfilment and in meeting ever-changing customer needs (Kumar, Medha, Mansha, & Patil, 2020). Food delivery aggregator allows consumers to search for the nearest and finest restaurant, serving delicious food, customers can have a range of dishes to eat, and they can conveniently order food from the app by tapping on their fingertips (Kapoor & Vij, 2018). Numerous food ordering services are present on the market, such as zomato, swiggy, Faasos, Domino's Pizza, and Pizza Hut. Consumers can pay the order amount through various payment options such as debit/credit cards, e-wallets, and cash on delivery (Rathore & Chaudhary, 2018) and UPI payments. The food delivery aggregator provides a live tracking system enabled by GPS on maps that allow consumers to know their order status (Gupta, 2019). Like the whole digital business boom worldwide, it has also had a significant impact on the Indian market. The Indian online food ordering industry is in its starting stage although is experiencing exponential expansion. The organized food business has enormous budding and a bright future (IBEF, 2019). By 2024 the market size of online food in India is projected to achieve USD 14,670 million (Statista). Food services are widening their operations from metro cities to urban cities in India. According to the official Zomato blog, Zomato has a footprint in 556 cities in India. As well as the response from the Indian Tier 2-4 cities were satisfying (Goyal Deepinder, 2019). Marketers are using various promotional strategies like discounts, referral coupons (Ghosh & Saha, 2018), and offers (Reddy & Pentyala, 2019) to attract new consumers and retain existing consumers.

## 2 Literature Review

The Promotion of sales stimulates the buying behavior of customers (Lamb, Hair, Sharma, & McDaniel, 2016), and it motivates consumers to purchase products or services instantly either by adding value to the product or reducing the price. Marketers use sales promotion as a tactic to encourage repeat purchases by consumers. It includes coupons, premiums, and the point of purchase promotion (Lamb, Hair, & McDaniel, 2011). Sales promotion encourages the purchase of a specific service or product, different promotional methods such as off-prices, and cash return deals used by advertisers to promote the purchase of consumers (Kotler &



Keller, 2012). Chang (2017) felt that sales promotions have a substantial effect on customer loyalty and purchase intent. Jain, Anthony, & Patil, (2020) felt that buying online food is a dynamic behavior since customers do not stick to buy food from one service. Customers can change their priorities, depending on the service provider's promotional offers.

## **2.1 Discounts**

Discounts offered by the food aggregator to the customers is one of the key motivating factors to buy food online rather than going to the restaurant (Kundu & Chatterjee, 2018). Prabhu and Dongre (2018) examined customer attitude and found that promotional strategy such as discounted prices motivate food ordering. Raman (2018) felt that idea of online food ordering is also gaining popularity in India, due to the different facilities provided by the company, such as flexible payment options, delivery of food at the door, and exciting deals and special discounts.

### **Coupons**

Eunha, Barrash and Feinstein (2007) examined the relationship between coupon promotion offered by restaurants and the willingness of customers to visit again. They recognize that food and service quality are key aspects of intent to return. As per Kang & Namkung (2019) new customers who are worried about high technology don't want to use mobile apps initially. For attracting them, companies need to promote the use of mobile apps through various loyalty programs such as coupons. Further, Alalwan (2020) stated that various restaurants facilitate with home delivery, discounts, and coupons if they use food ordering apps rather than visit the restaurants. Margarita (2015) felt that Coupons have reported playing an important role in motivating customers to purchase the product or service, thus helping companies improves sales.

### **Offers**

Chandrasekhar, Gupta, & Nanda (2019) Felt that the marketers were given exclusive offers to new users, this has made the online delivery service more attractive. Gera *et al.*, (2018) noted that food-tech start-ups offering a variety of special offer on different occasions that have helped to attract consumers. Swiggy uses offers as a tactic to retain the customer's orders regularly. Das (2018) observed that customers are often influenced while they obtain any Rewards and Cashback offers.

### **Premium**

According to (Lamb et al., 2011) Premium is an extra item offered to the buyer, commonly in return for some evidence of the purchase of the advertised product. Katole (2020) felt that along with other sales

promotion strategies, premiums also had a significant impact on customers. Premiums have a slight influence on purchasing behavior as compared with price reductions (Foubert, Breugelmans, Gedenk, & Rolef, 2018). Te'eni-Harari (2008) investigated the significance of premiums regarding youthful people and concluded that marketers should consider the possible impact of the premium and equivalent variables, which are most helpful to enhance premium efficiency, before taking any concrete promotional measure.

### **POP**

Point of Purchase is a tactic used by the service provider to promote the product or service, and it includes advertising on product carrying carts and bags, Signs affixed to counters of product or service delivery (Lamb et al. , 2011). It's challenging for businesses to attract new buyers and sustain loyal customers. According to (Rajagopal, 2008) retailers use the point of purchase as a tactical tool to draw probable patrons and retain the existing customers.

### **Research Objectives:**

1. To examine relationship between sales promotion and customer satisfaction towards online food delivery apps
2. To study the impact of sales promotions on customer satisfaction
3. To study the factors affecting online food delivery application user

## **3 Methodology**

This research described the correlation between sales promotional strategies with customer satisfaction, as well as factors influencing consumers buying decisions. This study is descriptive.

### **3.1.1 3.1 Data collection Method**

The Primary as well as secondary data was collected in this research, respectively. The Primary data was obtained by online food ordering customers, using a standardized questionnaire with the sample respondents. Secondary data needed for the study obtained in the relevant field from different earlier studies such as research publications in national and international journals.

### **3.2 Data collection tool**

The method used for the study to collect data is the standardized questionnaire, which helped to get the primary data from the respondents. The questionnaire contains multiple questions about the online delivery system, like, which food app you are using, factors that inspire you to order online food, preferred order time, use of the food app, and which is your preferred payment choice when you order food from the app.

### 3.3 Sampling Size

150 Users of Swiggy and Zomato undertook for the study. This includes males and females, different age groups, various income levels, both married and unmarried respondents with different educational backgrounds. The response rate was 88.2% out of 170 respondents. All the respondents who answer the questionnaire were from Hyderabad.

### 3.4 Sampling technique

A simple random analysis was adopted for data collection. Respondents were selected at random, and each individual has equal opportunity.

### 3.5 Statistical tests

In this study, three statistical tools were used to test the hypotheses based on the nature of the data. Pearson's correlation test has been used to assess the relation among, customer satisfaction sales promotions. Similarly, simple linear regression conducted to analyze the impact of sales promotion on customer satisfaction. Likewise, Cronbach's alpha used in the reliability testing is a measure of the scale's internal consistency.

## 1 4 Findings

### 1.1 4.1.1 Reliability test

Table 1: Cronbach's Alpha value

Cronbach's Alpha	No. of Items
.808	20

Cronbach's Alpha value is 80.8% percent, so that the data is accurate and we can analyze it.

### 1.1.1 4.1.2 Correlation of Sales Promotion and Customer Satisfaction.

Table 2: correlation

variables	Customer Satisfaction	Sig.
Point of purchase	.327**	.000
Discounts	.360**	.000
Coupons	.360**	.000
Offers	.255**	.002
Premiums	.368**	.000

\*\*Correlation is significant at the 0.01 level (2-tailed).

Interpretation: All variables have a significant relation with customer satisfaction towards online food delivery services. It is statistically relevant at 0.05. In terms of strength of the relationship, the Point of Purchase, Discounts, Coupons, Premiums has medium strength and offers have a small strength of

relationship. Correlation values between 0.3 and 0.7 are usually considered to be moderate, and less than 0.3 is considered to be weak relationship (Brian C. Cronk, 2017).

### 4.1.3 Impact of Sales Promotion on Customer Satisfaction:

Simple linear regression test used to explore the effect of sales promotion strategies.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.451 <sup>a</sup>	.204	.198	.826

*Predictors: (Constant), sales promotion*

Table 3 of the regression model summary reveals that the R<sup>2</sup> value is .204, indicating that a 20.4%

variation in the dependent variable is responsible by the independent variable.

Table 4: ANOVA

Model	Sum of square	df	Mean Square	F	Sig.
Regression	25.800	1	25.800	37.846	.000 <sup>b</sup>
Residual	100.893	148	.682		
Total	126.693	149			

a. Dependent Variable: Customer Satisfaction

b. Predictors: (Constant), sales promotion

Table 4 above describes that the value of F is 37.84 and the value of p is lower than .05, hence it

concluded that, the customer satisfaction of food delivery apps positively affected by sales promotion.

Table 5: Coefficients for Customer satisfaction and sales promotion

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.928	.329		5.865	.000
Sales promotion	.501	.082	.451	6.152	.000

Dependent Variable: Customer Satisfaction

Table 5 explains the impact of sales promotions on customer satisfaction towards customers of online food applications. The sales promotion value of the Unstandardized Coefficient is .501, and the

standardized coefficient value is .451 and the value of t is 6.152. It concluded that a sales promotion has a significant effect on consumer satisfaction, as p-value is lower than .05.

## 4.2 Behavioural Patterns of Customers

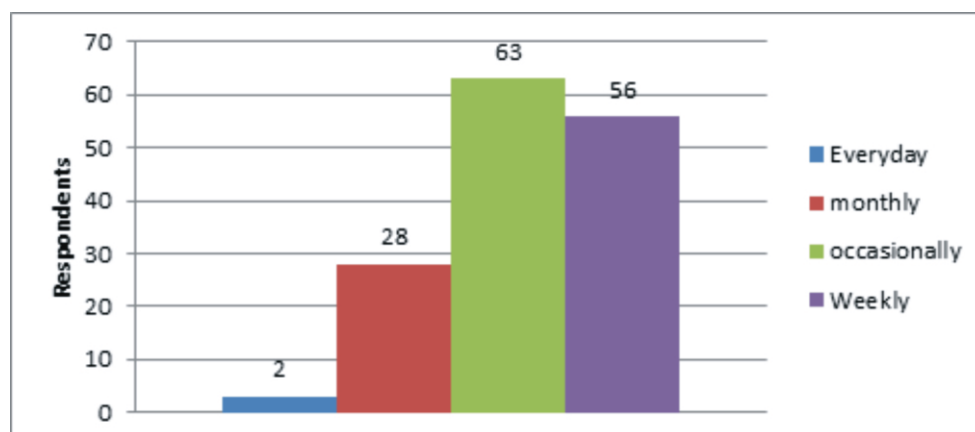


Figure 1: Usage of the app for Ordering Food

The figure 1 bar chart explain that 42% of the respondents order food occasionally, similarly, 37.3 % of the respondents ordering food weekly, likewise

18.6% of the respondents using food app monthly and only 2% are using every day.

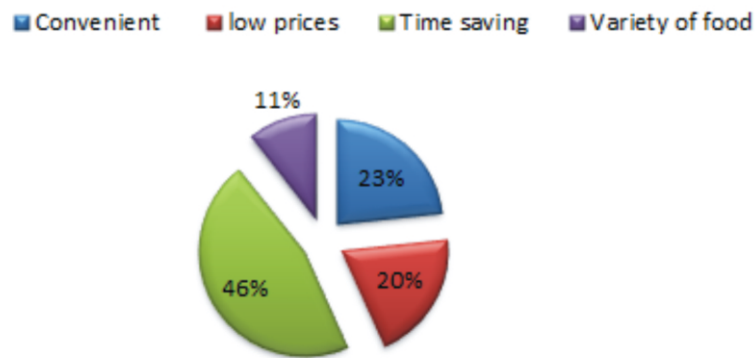


Figure 2: Factors Influencing Online Food app Consumers

The figure 2 shows that 46 % of respondents used online food delivery apps, because it saves time and 23 % of respondent's preferred online food for convenience rather than going to a restaurant,

likewise, due to low prices 20 % of respondents using food apps and only 11 % ordering food online due to a variety of food menus available.

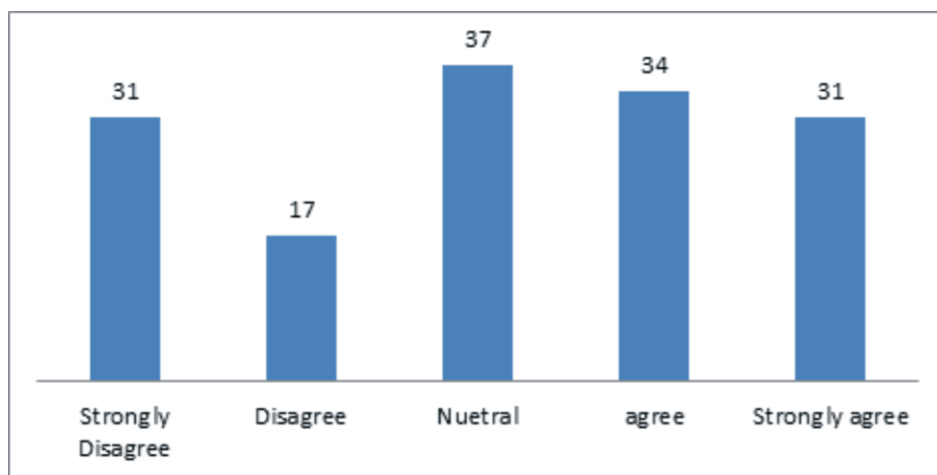


Figure 3: Influence of Social Media on Purchase Decision

The figure 3 illustrate that 43% of respondents collectively agreed and strongly agreed that social media advertisement positively influence their

purchase decision, and 32 % of respondents expressed they were disagree and strongly disagree. Remaining respondents neither agree nor disagree.

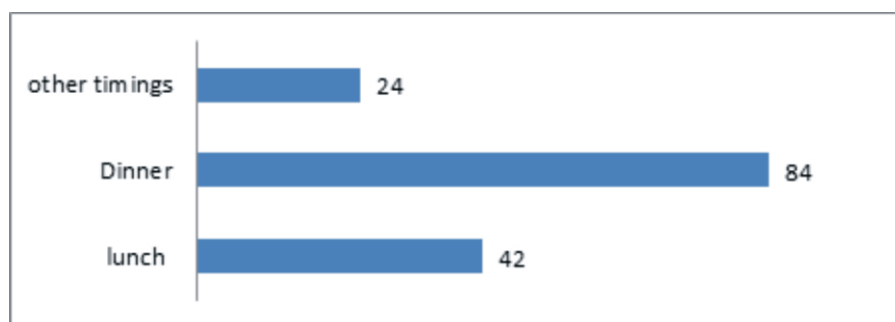


Figure 4: Most preferred time to buy online food



The above figure 4 bar chart demonstrate that mostly 56 % of respondents preferred online food during dinner hours, 28% of respondents prefer online food during lunch time, and 16 % of respondents prefer other timings like evening, snacks and special occasions.

### **Results and Discussion:**

The study's first objective was to determine the relationship among sales promotional strategies and customer satisfaction, and the empirical findings indicate a substantial relationship between sales promotion strategies. Second objective was to analyze the effect of sales promotion on satisfaction of customers, and the analytical result reveals that sales promotion has positive effect on customer satisfaction. Marketers need to use various appropriate tactics to stimulate consumer behavior. Through offering Discounts on Deals, Coupons for current customers will attract to order regularly, and marketers should also concentrate on premiums when consumers purchase food from service and get additional items like desserts or drinks along with actual food purchased by customers would contribute to customer satisfaction. The third objective was to find out factors affecting online food app users, the findings of the study signify that most of the customers prefer to buy food online, because of time-saving, thus food aggregator must deliver the food quickly without delay in service, for improving the efficiency of delivery time, food aggregator need to hire local delivery partners who are familiar with local roots. Respondents were asked usage frequency of the food app, most of the respondents using online food occasionally and weekly twice or thrice. Interestingly when respondents were asked which food app is using, the majority of them using both swiggy and zomato. During dinner time most respondent's preferred online food. This study suggested that marketers should increase restaurant availability and variety of dishes during dinner time, and strengthen the delivery fleet to prevent delays during rush hours.

### **Managerial implications:**

This research would contribute to the current literature by adding new knowledge in terms of the significance of sales promotional strategies concerning online food delivery service. Besides the theoretical contribution, this study provides a more empirical understanding of factors influencing customers, which helps marketers to design marketing strategies according to consumer preferences and needs. For instance, most consumers use online food during dinner time, so marketers need to increase restaurant availability and the delivery fleet during dinner time to avoid delays in delivering food to customers. The quality of delivery time, which affects

consumer experience, should be given much priority.

### **Limitations of Study and Scope for Future Research:**

Although this study does have several limits, the obtained data in this study was confined to Hyderabad, India. Additional future research can be done in different regions of the country. The second limitation is its sample size of 150, which may increase to achieve more accurate results. The third limitation is time factor as time goes by, various other factors would influence consumer behavior. Finding other determinants of customer satisfaction should be critically evaluated, in addition to sales promotion strategies. For the future, more research can be done using different tools and techniques, such as the effect of the marketing mix on consumer loyalty, food safety, and online food security.

### **5 Conclusion:**

The literature shows that various studies have done on customer perception, retention, and engagement in different contexts. Thus the study aims to investigate the significance of sales promotions and various factors that influence online food delivery users. The empirical findings indicate that sales promotions have a significant impact on consumers of online food delivery. Because of time-saving and convenience most customers order food online. For Dinner, most respondents chose online food.

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# Analysis of the Mediating Effect of Customer Satisfaction on the Relationship Between Service Quality of CRM Practices and Customer Loyalty in the Banking Sector

Kamlesh L Patel, Sanjay G Raval

## ABSTRACT:

*This research article aims to a detailed study on the concept of Service-Quality of CRM practices, Customer-Satisfaction and Customer-Loyalty and establishes their functional relationship in public sector banks of Gujarat. On the base of the literature review and expert suggestions, the authors propose an experimental investigation of the mediating effect of Customer-Satisfaction on the relationship between Service-Quality of CRM practices and Customer-Loyalty. The present study attempts to explain the concept of mediation, authors were collected the data of 325 customers' perceptions of public sector banks of Gujarat. Applying Baron & Kenny (1986) steps, various regression models were developed by SPSS 20 and tested the causal relationships among the constructs. Further, Sobel's test was concluded that Customer-Satisfaction fully mediating the relationship between Service-Quality of CRM and Customer-Loyalty.*

**Key words:** Service-Quality, Customer-Satisfaction, Customer-Loyalty, Sobel's test

## 1. INTRODUCTION:

CRM methods are the backbone of any service sector organization to enhance the relationship between customers and organizations. In the banking sector, it is necessary to use CRM methods to increase Customer-Satisfaction and Customer-Loyalty. Today's highly competitive, volatile and changing business situation, frequent dictatorial pressures, structural and technological changes and the modern economic crisis have created high competition in the banking sector in countries around the world. (Klein & Barth, 2005). Service-Quality, Customer-Satisfaction has become key business principles to complete the bank's primary function and to maximize revenue for an organization (Tornjanski, Marinkovic, Levi, & Bogojevic, 2015). Customers are at the centre of today's business and represent the organization's most valuable asset (Martelo, Barros, & Cepeda, 2013). Customer Relationship Management (CRM) is a significant factor in improving bank performance and ensuring Customer-Satisfaction. Customer Relationship Management involves organizing activities around the customer that can ensure a difference by creating a unique experience at each stage of the service. In reality, with the increase, struggle in the retail banking sector has intensified the use of CRM as a means of gaining competitive advantage (Anbuoli & Thiruvengatraj, 2015). The bank has also understood the significance of focusing on service quality as an approach to Customer-Satisfaction and Customer-Loyalty and to develop their core competence and business performance (Yadav & Rai, 2019)

## 2. REVIEW OF LITERATURE:

### 2.1 Service-Quality:

The quality of the services is an extremely difficult qualitative factor to standardize. However, the majority of the studies in this field, they concluded that the quality of service has a definite effect on customer satisfaction. Service-Quality defines as the degree of difference in terms of ideal expectations for customer service and service operation (Parasuraman, Zeithaml, & Berry, 1988). The quality of customer service, which means ensuring customer satisfaction at all times, has become a key factor in determining the success and growth of an organizational business (Titus & Nathan, 2019). The Service-Quality of customers is greatly affected by many ways; customers are approached and treated at various counters with the organization by the bank's front line and support staff. Customers experience services in terms of Service-Quality and overall satisfaction with their experience (Hennayake, 2017). Service quality is having a positive and significant link with Customer Satisfaction, optimistic phrase of mouth and reliability intention (Vanpariya & Ganguly, 2010) (Vijay & Selvaraj, 2012). The American Marketing Association defines quality of service in its dictionary page as "a field of study developed to define and describe how services can be delivered to the recipient in a satisfactory manner." Providing satisfactory services to partners can influence a customer's decision to purchase products. Relevant research also pointed out that improving service quality is a key factor for a success of business (LiHsien & Shu, 2019) (Ahuja & Khamba, 2008)



## 2.2 Customer-Satisfaction:

Banks have used CRM methods but that level varies from bank to bank. Furthermore, it shows that there is a large amount of positive relationship between Service-Quality and Customer- Satisfaction in the Egyptian banking sector (Heba & Passant, 2013). Specific satisfaction is related to a specific product or service, while accumulated satisfaction is a general evaluation of the entire process of meeting with the service. Simply put, customer satisfaction is a way to cultivate and raise expectations in customer choice and value creation (Rahim, 2016).

## 2.2 Customer-Loyalty:

Pre-service loyalty is a positive and significant relationship between e-CRM during service and post-transaction functions, and it significantly predicts loyalty during pre-service and service facility. Therefore, improving the e-CRM system can be a strategically competitive tool for influencing banks 'relationships with their customers. (Eric, Khabala, & Krishna, 2017). In today's highly competitive market, the banking industry needs to go through a transformation process and at the same time keep the customer at the centre of its business. Therefore, customer relationship management has evolved with the ultimate goal of enhancing customer satisfaction and consequently enabling customer loyalty based business building. (Vesna, Snezana, & Boris, 2017). The customer who repeats the purchasing behaviour of the service provider has a positive attitude towards the provider and considers using this provider when the service is needed. "Loyalty is an attitude or behaviour that customer clearly voice or display. (Yadav & Alok, 2019)

## 2.3 Customer-Satisfaction as a mediator:

Customer-Satisfaction is a mediating variable that has a positive effect on Customer-Loyalty. Customer-Loyalty research can be recommended to bank management to apply the right CRM tactics and maintain enduring relationships with key customers (Suyono, 2019). Customer-Satisfaction enhances reputation in a service environment. It has also been found that reputation partially mediates the

relationship between satisfaction and loyalty, and that it partially mediates the relationship between reputation satisfaction and recommendation. (Nick, Lorne, & Alexander, 2015). The relationship between Service-Quality and Customer- Loyalty is mediated by Customer-Satisfaction. As a role of mediating variable, customer satisfaction represents 83.03% of the total fluctuation between the relation of Service-Quality and Customer-Loyalty (Yadav & Alok, 2019). Customer-Satisfaction has a very significant positive effect on loyalty by totally mediating the variation of all of the 4 Service-Quality dimensions, which were found to affect loyalty directly (Ilias & Panagiotis, 2009).

## 3. RESEARCH METHODOLOGY:

A descriptive research approach was adopted in order to study and explain the cause and effect relationships between Service-Quality, Customer-Satisfaction and Customer-Loyalty. This was accomplished through online Google survey with the help of structure questionnaire. The questionnaire was developed by largely adopting the constructs used in SERVQUAL model given by Parasuraman (Parasuraman, Zeithaml, & Berry, 1988). In this research Service Quality of CRM practices was measured by following 5 dimensions.

**Reliability:** the aptitude to execute the promised service frequently and precisely.

**Assurance:** the knowledge and politeness of employees and their skill to convey trust and confidence.

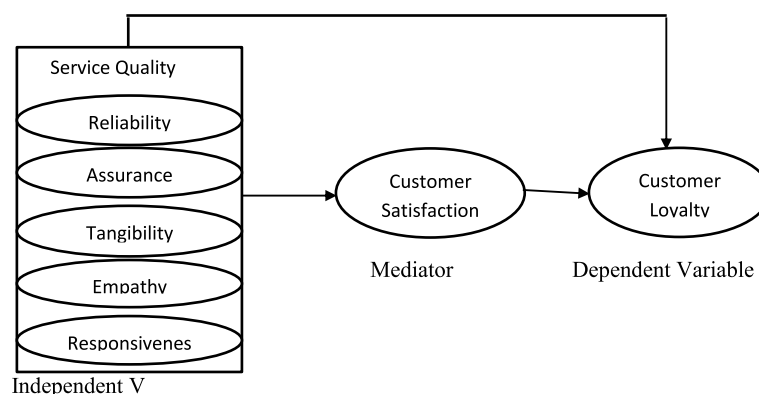
**Tangibility:** the exterior of the physical facilities, equipment, employees and communication materials.

**Empathy:** the stipulation of gentle, individualized interest to customers.

**Responsiveness:** the enthusiasm to assist customers and to give punctual service.

### 3.1 Conceptual Research Model:

The following conceptual framework clears the relationship between Service-Quality of CRM practices, Customer-Satisfaction and Customer-Loyalty.



### 3.2 Objectives of the Study:

According to review and experts suggestions, authors will have following objectives.

- (1) To identify the relationship between Services-Quality of CRM practices and Customer- Loyalty in public sector banks of Gujarat.
- (2) To decide the association between Services-Quality of CRM practices and Customer-Satisfaction in public sector banks of Gujarat.
- (3) To explore the impact of Service-Quality of CRM practices and Customer-Satisfaction on Customer-Loyalty in public sector bank of Gujarat.
- (4) To investigate that the mediating role of Customer-Satisfaction on the relationship between Service-Quality of CRM practices and Customer-Loyalty in public sector bank of Gujarat.

### 3.3 Statistical Hypotheses:

Authors test the following hypotheses.

- (1)  $H_{01}$ : The relationship between Service-Quality of CRM practices and Customer-Loyalty is not significant in public sector banks of Gujarat.
- (2)  $H_{02}$ : The impact of Service-Quality of CRM practices on Customer-Satisfaction is not significant in public sector bank of Gujarat.
- (3)  $H_{03}$ : The impact of Service-Quality of CRM and

Customer-Satisfaction on Customer- Loyalty is not significant in public sector bank of Gujarat.

- (4)  $H_{04}$ : The relationship between Service-Quality of CRM practices and Customer-Loyalty does not mediated by Customer-Satisfaction in public sector banks of Gujarat.

### 3.4 Sampling Procedure:

To investigate targets; initially 40 clients of public sector banks in the state of Gujarat were selected in our pilot test of the questionnaire. The 40 clients understood each item of the 5 Service-Quality parameters of the CRM practices, Customer-Satisfaction and Customer- Loyalty and the results of the pilot test were statistically significant. To fulfil the objective data of 325 customers were collected from public sector banks of Gujarat state by a simple random sampling method.

## 4. DATA ANALYSIS AND INTERPRETATION:

**4.1 Reliability:** The reliability of the questionnaire was assessed by Cronbach's Alpha for each item of Service-Quality, Customer-Satisfaction and Customer-Loyalty of randomly collected data of 325 customers. The value of Cronbach's alpha for each individual item was greater than 0.92 and the three construct variables alpha values were 0.775 and higher. Also, the overall Cronbach's alpha was 0.88 which indicates that an internal consistency of data is very high.

**Table 1**

Variable	Cronbach's alpha
Service Quality	0.775
Customer Satisfaction	0.886
Customer Loyalty	0.883
Overall value	0.88

**4.2 Correlation:** the causal relation and its strength among the constructs:

**Table 2**

Pearson correlation coefficient

Variable	Service-Quality	Customer-Satisfaction	Customer-Loyalty
Service Quality	1		
Customer Satisfaction	0.671**	1	
Customer Loyalty	0.513**	0.710**	1

Note: Correlation is significant at 0.001 (2- tailed)

Table-2 indicates that there is a significant relationship between the variables at 0.001 level. Customer-Satisfaction and Customer-Loyalty have strong positive correlation (0.710) while Service-Quality and Customer-Loyalty have moderate relationship (0.513).

**4.3 Regression Analysis:** According to Baron and Kenny (1986) mediating effect of variable can be tested by following regression models.

Table 4

Summary of the Relationship					
Model	Path	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Sig. P value
1	X→ Y	0.513	0.263	0.261	0.000
2	X→ M	0.671	0.450	0.449	0.000
3	X→ M→Y	0.712	0.507	0.504	0.000

Note: X = Service Quality, M = Customer Satisfaction, Y = Customer Loyalty

Step 1: Table-4 shows that p value of model-1 is less than 0.05 hence  $H_{01}$  is rejected that is Service Quality (X) has significant impacted on Customer Loyalty (Y). Also Adjusted R<sup>2</sup> is 0.261 which indicates that Service-Quality explained 26.1% variation on Customer-Loyalty.

Step 2: Table-4 revealed that model-2 is significant as critical value p is less than 0.05, hence  $H_{02}$  is rejected therefore the mediating variable Customer-Satisfaction (M) has moderately regressed Customer-Service (X) at pre-decided 5% level of significance. Also adjusted R<sup>2</sup> value is 0.449; hence Customer Service explained 44.9% variation on mediating variable Customer Satisfaction.

Step 3: p value in model-3 is not greater than 0.05 therefore  $H_{03}$  is rejected at 5% level of significance

hence; Service-Quality (X) and mediating variables Customer-Satisfaction (M) were significantly explained Customer-Loyalty (Y). Moreover adjusted R<sup>2</sup> value is 0.504; therefore Customer-Service and Customer-Satisfaction had explained 50.4% variation on Customer-Loyalty.

Step 4: From table-5, the regression coefficient of X in model-1 that is  $\beta_{11} = 0.672$  and regression coefficient of X in model-3 that is  $\beta_{13} = 0.087$  since  $\beta_{11} > \beta_{13}$ , moreover Customer-Service (X) not significantly impacted on Customer-Loyalty (Y) as p value is 0.208 in model-3, hence Condition laid down by Baron and Kenny, Customer Satisfaction (M) significantly mediate the relationship between Customer-Service (X) and Customer-Loyalty(Y).

Table 5

Summary of Beta Estimates					
Model	Model Equation	Coefficient	Standard Error	t	Sig.
1	$Y = \beta_{01} + \beta_{11}X + \varepsilon_1$	$\beta_{11} = 0.672$	0.063	10.744	0.000
2	$Y = \beta_{02} + \beta_{12}M + \varepsilon_2$	$\beta_{12} = 0.827$	0.051	16.269	0.000
3	$Y = \beta_{03} + \beta_{13}X + \beta_{23}M + \varepsilon_3$	$\beta_{13} = 0.087$	0.069	1.260	0.208
		$\beta_{23} = 0.707$	0.056	12.603	0.000

Note: X = Service Quality, M = Customer Satisfaction, Y = Customer Loyalty

**4.5 Sobel's Test:** To test the mediating effect of mediator on independent and dependent variables, Z statistic of Sobel's test was calculated by Kristopher & Geoffrey calculator (Kristophar & Geoffrey).

Table 6

Sobel's Test		
Sobel's Z statistics	SE of Statistic	Sig. p
8.91150614	0.06236252	0.000

Z statistic of Sobel's test is 8.91150614 which is greater than critical value 1.96 ( $p < 0.05$ ) at 5% level of significance therefore  $H_{04}$  is rejected hence Customer-Satisfaction mediates the relationship between Service-Quality and Customer-Loyalty.

## 5. FINDING OF THE STUDY

This study examine that the relationship among Service-Quality of CRM, Customer- Satisfaction and Customer-Loyalty in public sector banks in Gujarat. From the evidence obtained from public sector bank of Gujarat, we find that perception of Service-Quality is positively related with Customer-Satisfaction and Customer-Loyalty with respect to public sector banks of Gujarat. It also investigates Customer-Satisfaction positively related with Customer-Loyalty in public sector banks of Gujarat.

The study also suggests that Customer-Satisfaction significantly influences the building of Customer-Loyalty of public sector banks in Gujarat and fully mediates the relationship between Service-Quality of CRM and Customer-Loyalty. It suggests that if management wants to improve Customer-Loyalty, they should ensure that the quality of CRM service improves customer satisfaction. Therefore, Customer-Satisfaction improves the relationship between the Service-Quality of CRM practices and the Customer-Loyalty of public sector banks of Gujarat.

## 6. LIMITATIONS AND SCOPES OF THE STUDY:

This study was carried out for customers of public sector banks of Gujarat State; hence geographical boundaries affect the result of the research. In the study while authors has been assumed that Customer-Satisfaction is directly related with Service-Quality of CRM practices and Customer-Loyalty which means that possibility of multiple mediations and moderations has been ignored. The study has been used many statistical techniques, these techniques have their own limitations; all these limitations also laid down on the research.

The present study can be used for other service sectors such as Insurance service, Airline service, Internet service, Mutual fund etc. Thus scholars in future may add some more mediating variables such as Service Cost, Switching Cost, Trust etc. in present model and testing the existence and impact of relationships discussed and demonstrated here.

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# Analyzing the Effect of Consumer Attitude Between Brand Preference and Consumer Satisfaction as a Mediating Variable

Sailaja Bohara, Diksha Panwar, Shivendra Chaudhary

## Abstract

**Purpose:-** The word brand differentiates goods and services of one company from other companies. Preference for the particular brand implies the brand is acknowledged and favored over other in a similar product or services classification. Consumer satisfaction is very important for any company as it means that the product or the service is able to meet the expectation of the consumer. Therefore, brand experience may lead to brand satisfaction which leads to brand preference. In this era, where there is so much competition between the brands and availability of so many products of different brands, consumers always try to look for information that can solve their problem whenever they face any difficulty. Their expectation from brands increases. At this moment attitude of consumer play an important role in shaping preference for a brand. Understanding consumer's attitude gives business the idea to make changes and face the competitors. Therefore, it has gained lots of importance among the marketers to study and understand consumer's attitude. The aim of the study is to know the effect of consumer attitude on consumer satisfaction through brand preference.

**Design/Methodology/Approach:-** The research was done with primary and secondary sources. To analysis module developed by Andrew F Hayes process macro in IBM SPSS was used. Three hypotheses were developed, based on this framework. A questionnaire was developed with sample size of 350 was collected from Dehradun. The population was finite and the method used was non probability convenience sampling.

**Findings:-** The study reveals that consumer satisfaction has a direct relationship with brand preference but when consumer attitude act as a mediator between them it accounted for significant and practically meaningful proportion of variance between brand preference and consumer satisfaction.

**Originality/ Value:-** The study provides several useful insights related to understanding of brand preference, consumer attitude and consumer satisfaction. Brand preference indicates the firmness of a brand in the minds of consumer. Setting preference of their brand in the minds of the consumer is critical for marketing efforts done by the company. A consumer starts preferring a brand after having an experience with that brand. Consumer's interaction with the brand is very important as it creates perception about that brand in their minds. Satisfaction obtained by the trail to buy and use of goods and services of the specific brand gives a way to brand preference. The article provides a conceptual framework that helps to test the hypotheses and concluded that consumer satisfaction has a direct relationship with brand preference but when consumer attitude act as a mediator between them it accounted for significant and practically meaningful proportion of variance between brand preference and consumer satisfaction. The ability of positive or negative attitude results in increase and decrease of brand preference and consumer satisfaction.

**Keywords:-** Brand, Brand Preference, Consumer satisfaction, consumer attitude. Brand Experience, Expectation, Consumer interaction

## Introduction

Preference, portend desirable selection of a product or brand over an alternative. Brand preference refers to as a consumer's inclination towards a brand that varies as per the effects that the brand has created on the consumer's mind. It simply, means consumer's biasness towards a specific brand because of the purchaser's judicious, enthusiastic or social reactions towards the brand recommendation and different marketing strategy. In a practical scenario, brand preference demonstrates a longing to search out a particular product or administration regardless of whether it infers paying more or using more exertion to discover it.

Brand preference implies the brand is acknowledged and favored over other in a similar product or services classification. This generally happens after satisfaction obtained by the trail to buy and use of goods and services of the specify brand. Consumers awareness can be increased by the means of branding a product.

Brand preference generally leads to brand loyalty. A consumer certainly favors on brand over competitive brands and will buy this brand if accessible to the consumers will acknowledge a sub suite brand instead of consuming extra exertion finding and acquiring the favored brand. A marketer is likely to compete with other brands adequately in a market when various consumers have created brand preference for their particular brand.

Consumers always try looking for information that can solve problem when they face difficulties. Their expectation from brands increases. They want that the brand should listen to them and help them in regardless to their problems as well as address their need. Shopper enablement is that the most powerful tool during the marketing of the brand. It connects brand directly with the consumers. This in turns results in the engagement with the competitive advantage by delivering the right dealings and satisfies the consumers at the right time through the best channels. Understanding consumer's attitude gives business the idea to make changes and face the competitors. Therefore, it has gained lots of importance among the marketers to study and understand consumer's attitude. The aim of the study is to know the effect of consumer attitude on consumer satisfaction through brand preference.

The structure of the article is as follows. The first section 'Theoretical review and hypothesis development' shows the previous literatures of the study and derived hypothesis. The next section consists of 'Research Methodology' showing methods of data collection and data analysis. In the next section we draw the conclusion of the paper and also highlight its managerial implications and limitations of the study suggesting the scope for the future study.

## Theoretical Review and Hypothesis Development

Client characterized catchphrases, co-related with online issues which shows the shoppers' view of the distinctive product which incorporates products and brands are known as social labels (Hyoryung Nam, Yogesh V. Joshi, and P.K. Kannan 2017). The research done right now new methodologies for gathering subjective data on brands from client created social labels. From the outset, the examination has been made by the author on their proposed approach like brand idea maps and content mining with customary procedures. They have featured the worth added to their methodology that has come about because of the substance produced by the consumer inside the social labels. In the following stage, the rest of the content mining and techniques for information



decrease are applied to analyze, breaking it down into various degree of social labeling. This aide in promoting research and furthermore, shows how advertisers can use the accumulated data in social labels by duplicating out the key delegate points, managing all the normal powerful patterns, and understanding the heterogeneous view of brands.

Muniganti Praveen, N.Revathi (2017) stated that needs and preferences of the consumer should be seen by manufacturers while manufacturer their products as it should suit the consumer. In simple words producer's success will be decided by the emerging needs and preferences of the consumer. According to Delphine and Stephane (2017), material and social cues of the service cape, influence consumers class with brands – that is these brands make consumers behave as a class subject, believing that they have specific understanding of their position in the social hierarchy. So, one need to understand that to manage status, active creation and management of consumer class subject is required. There has been a shift from managing just branded goods that which gave status signal to managing consumers experience with the branded good as it makes consumers enact to their status position. According to George Balabanis & Nikolettia-TheofaniaSiamagka, (2017), there is little proof to be found in the writing on buy conduct of consumers considerably after the fixed effect of buyer ethnocentrism (CET) on buy goals. This paper tended to the hole by examining every one of those variables which cause varieties in CET conduct. The class of the item, its expense and its imagery, name of the brand and nation of starting point (COO) of the item bought are examined to see the effect that it causes in the CET conduct. The outcomes affirm that the item classification is the most significant determinant of the social impact of CET. buy done on costly items has a significant critical effect on CET than buy done on often bought items. In Contradictory, to the proof that has been discovered before, the similitude in societies doesn't lessen the antagonistic impacts of CET and item visalness doesn't upgrade the conduct impact of CET. Savarimuthu & Chandrakumar (2017), states some factors keeping in consideration the preference criteria of people before they go to purchase any commodity, attributes of the product, like its price, the resale value, credit facility etc are considered. Any favourable change in the product attribute can give a way to the brand preference of the consumers as these products have significant role in the choosing the brand of the product. From the result obtained, it is recommended that the manufacturers should focus more in developing product to comfort level of the consumers as it is the major factor that affects brand preference of any product. Akila et al. (2015) in their study revealed that most of the respondents were in the age category above 30, most being male and few females. Findings were that 81.2% of the consumers agreed that the quality of branded products are better and on the other hand 15.7% of the respondent said that branded products always does not have better quality. It has been found that income and different brands that one owns and the estimated budget have a significant relationship. Also, there is an important relationship between occupational factor and the other variables like brand purchased, various offers and

finance.

The buying behavior of the consumer is formed through their attitude, preference and their intention towards that product. For marketers it is important to know the needs and preferences of the customers to be successful like the herbal companies as soon as they understood the needs and preferences of their customers, they shifted to manufacturing of cosmetics based on ayurveda (G.R.Joshi, 2017). Consumer preference for any brand can increase the satisfaction level of consumer for that particular brands product. Britannia products are preferred because of the taste, advertisement, price and goodwill. Customer satisfaction for is achieved by continuously keeping the consumers aware about taste and quality of the product. A customer will go and ask for Britannia biscuits because of the advertisements and if it's not available there then no other brand will be recommended (V. Kannan, 2017; Suresh, 2016). According to Antonia & Savina (2016) consumer's preference varies for branded and non- branded products. People trust more on branded product than on non-branded as branded product gives them a sense of security than non -branded product. People in India are very conscious about the brand. The purchase decision of a consumer is influenced by quality, family, friends, comfort level, their fashion desire and demographic factors. Price of the brand does not affect much when it comes to clothing. When it comes to apparels the two factors – a customer's intrinsic pleasure, and status and prestige measures their attitude towards the brand (Rajput. N 2012; Neelam, 2016). A customer's attitude is a mixture of consumer's feelings, beliefs and behavior that they have towards an object. A consumer may have either positive attitude or negative attitude towards an object because of the positive feeling or negative feeling or belief and behavior (Poranki, 2015). There is a significant relationship between a brand and preference of the consumer. Consumer will buy the product of his or her preferred brand, then some other brand. The name of the brand plays an important role while making the purchase decision. The experience that consumers get after using the brand built the preference for that brand. (Abdurrahman & Mehmet, 2015). According to Ammar (2015), customer satisfaction is very important as it will lead to repurchase of the product or product of that brand. Customers are different in terms of their buying behavior, needs and their preference. Customer satisfaction and dissatisfaction is influenced by perceived quality (Lee et al., 2015). The attitude of the consumers towards the product or the company influence the level of success or failure (Kameswara et al., 2014). For any marketing firm it is important to do consumer survey to understand their buying behavior which is affected by demographic factors, quality and price of the product. Customer satisfaction is important in such cases. The success of Titan watch lies in the fact that customers are highly satisfied with the brand (Halamata, 2013). Identifying the product and differentiating it with the other products is the two major function of brand as consumers will have preferences for the brand only after when they can differentiate them. Consumers preference for the

brand is very important in the purchase decision for a product( Florek, 2005; Jin & Weber, 2013).The appearance of the product also gives value to the product which have an effect on consumer's evaluation for the product which adds onto one of the attribute in the preferences and choices of the consumers (Creusen& Schoormans, 2005; Reimann et al., 2010). Renuka and Hireken chanagoudar (2009) in their study found that consumer's behavior towards a product change according to the type of product also. They also found that quality, flavor and fair price have an influence on brand preference for chips, fruit juice biscuits and ice-creams. According to Kotler & Keller (2009) consumer attitude is formed through their experience and learning. This attitude formed has an influence on the purchase behavior for any kind of product. According to (Choo et al., 2004) customer attitude has a positive influence on customer behavior for purchasing any product. There exists a causal relation between attitude of the customer and their purchase behavior.

Consumers have favorable and unfavorable attitude towards a store, brand, advertisement and the like which affects their preference. There is likeliness of the store being selected and its product being purchased by the consumer if consumer will have a favorable attitude and vice versa (Moye & Kincade, 1999). The results confirm that Indian people have become highly brand conscious presently. Hence, brand image is a not a significant factor in choosing the product or brand to buy. There are other aspects like, quality, comfort, expectations and demographic characteristics are also influence to the purchasing decision that dominate the purchase decision of males and females. From the analytical introspection it is evident that the gender differences do exist with respect to build attitude towards fashionable apparels and brands. Further, the variation in age and income is not significant as consumers preferred brands or outfits irrespective of that.

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The previous literatures have focused on brand preferences and factors affecting the purchasing decisions in different places in our country. But, there is no much study on brand preferences and its effect on level of consumer satisfaction with consumer attitude. Therefore, considering the above gap the present study has included the following gap, the appropriate hypotheses has been formulated for the present study.

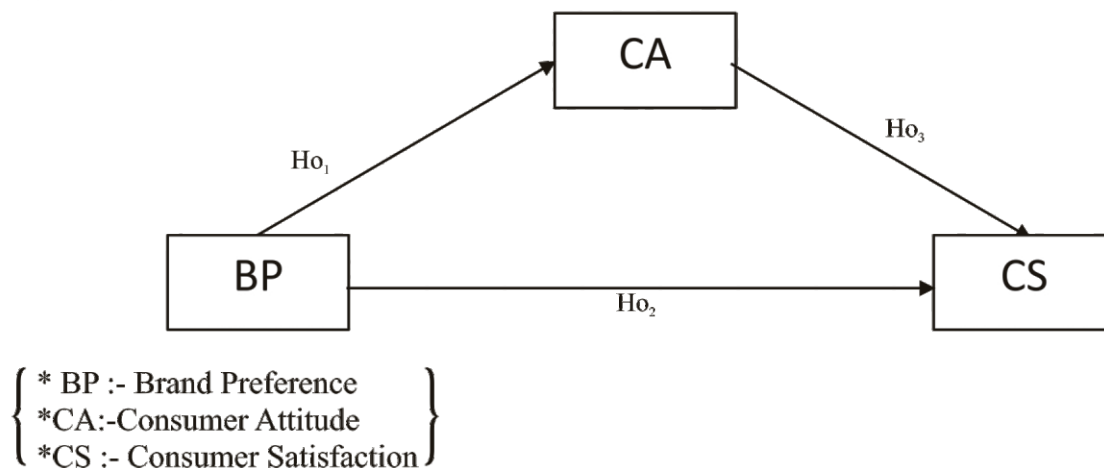
Ho<sub>1</sub>: Brand Preference has a significant impact on consumer attitude Ho<sub>2</sub>: Brand Preference has a significant impact on consumer satisfaction Ho<sub>3</sub>: Consumer attitude has a significant impact on consumer satisfaction Ho<sub>4</sub>: Consumer attitude act as a partial mediator between brand preference and consumer satisfaction

#### Methodology

With an extensive literature review the research was done with primary and secondary sources and the gap was identified was to know the effect of consumer attitude on consumer satisfaction through brand preference. A model was projected (figure 1,) and took the analysis using a module developed by Andrew F Hayes process macro in IBM SPSS. A questionnaire was developed with sample size of 350 was collected from Dehradun. Since our population was finite and the method used was non probability convenience sampling.

#### Data Analysis

Fig. 1 Projected Model (Model we wanted to test)





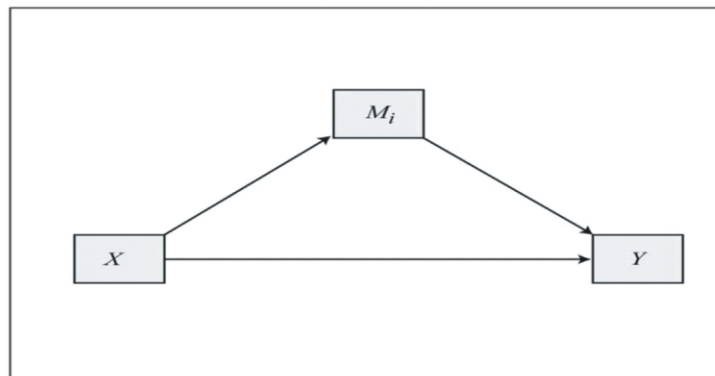
Our research was to know if consumer attitude play any role in intensification of consumer satisfaction. As seen above Brand Preference is the independent variable and consumer satisfaction is the dependent variable and consumer attitude is acting as mediator.

Model 4 (by Andrew F Hayes )was used as an ideal model . Model 4(indirect effect of IV on DV through mediator) is the best suited model with one mediator and one IV(independent variable) and one DV(Dependent Variable).

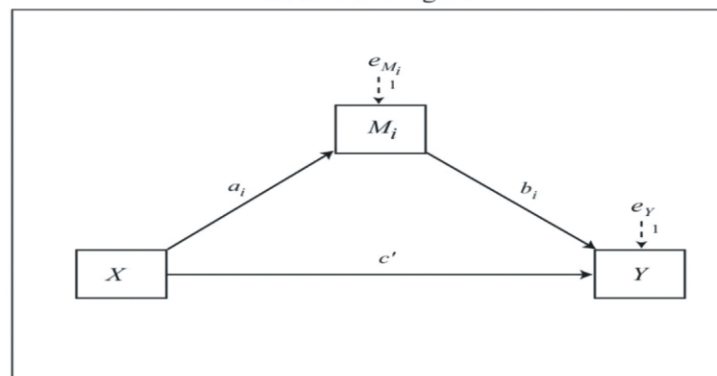
Model Templates for PROCESS for SPSS and SAS  
©2013-2015 Andrew F. Hayes and The Guilford Press

#### Model 4

##### Conceptual Diagram



##### Statistical Diagram



Indirect effect of  $X$  on  $Y$  through  $M_i = a_i b_i$   
Direct effect of  $X$  on  $Y = c'$

Note: Model 4 allows up to 10 mediators operating in parallel.

A mediation model is used to links aacknowledgedorigin (X) to a supposed effect (Y) with an intermediary or “mediator” variable (M).  $X \rightarrow M \rightarrow Y$  is a causal chain of events. A mediator

variable can be a psychological state, a cognitive process, an affective response, a biological change, or any other conceivable “mechanism” variable through which X exerts an effect on Y.

Model : 4  
Y : cs  
X : BP  
M : CA

Sample  
Size: 350

(Table:1) OUTCOME VARIABLE:  
CA

##### Model Summary

R	R-sq	MSE	F	df1	df2	p
.3860	.1490	2.8119	60.9397	1.0000	348.0000	.0000

##### Model

	coeff	se	t	p	LLCI	ULCI
constant	8.3532	.9937	8.4061	.0000	6.3988	10.3077
BP	.2625	.0336	7.8064	.0000	.1964	.3287

The above output shows the result of regression between brand preference and consumer attitude. Brand preference has significant relationship with consumer attitude ( $b=0.2625$ , 95%, CI [.1964, .3287],

$t = 7.8064$ ,  $p = .0000$ ). Since there is a significant relationship between brand preference and customer attitude hence the hypothesis brand Preference has a significant impact on consumer attitude is accepted.

(Table :2) OUTCOME VARIABLE:

cs

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7081	.5014	.8267	174.4800	2.0000	347.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	2.8322	.5910	4.7924	.0000	1.6698	3.9945
BP	.3025	.0198	15.3038	.0000	.2636	.3414
CA	.1155	.0291	3.9742	.0001	.0583	.1727

\*\*\*\*\* DIRECT AND INDIRECT EFFECTS OF X(IV) ON Y (DV) \*\*\*\*\*

Direct effect of X(IV) ON Y (DV)

Effect	se	t	p	LLCI	ULCI
.3025	.0198	15.3038	.0000	.2636	.3414

Indirect effect(s) of X(IV) ON Y (DV)

	Effect	BootSE	BootLLCI	BootULCI
CA	.0303	.0095	.0130	.0505

The above output (model summarytable : 2) shows the result of regression of consumer satisfaction predicted from both brand preference and consumer attitude. Brand Preference has significant relationship with consumer satisfaction ( $b=0.30$ , 95%, CI [.2636, .3414],  $t = 15.3038$ ,  $p = .0000$ ) whereas there is a significant relationship between consumer attitude and consumer satisfaction ( $b = .115$ , 95%, CI [.0583, .1727],  $t = 3.974$ ,  $p = .0001$ ). The  $R^2$  value explains (50.14%) of variance in consumer satisfaction. Hence the hypothesis i.e., brand Preference has a significant impact on consumer satisfaction and consumer attitude has a significant impact on consumer satisfaction is accepted.

The above output also display direct effect between brand preference and consumer satisfaction,  $t$  value is 15.3038 (more than 1.95) and  $p=.000$  (less than 0.05) and zero is not falling between LLCI and ULCI (.2636, .3414). The output also displays the indirect effect of brand preference and consumer satisfaction (i.e the effect via consumer attitude). The  $b$  value for the indirect effect falls between .0130 and .0505. This range does not include zero and  $b=0$  would mean no effect, therefore the fact the confidence interval does not contain zero which supports that consumer attitude does mediate the relationship between brand preference and consumer satisfaction. Hence the hypothesis i.e., consumer attitude act as a partial mediator between brand preference and consumer satisfaction is accepted.

## Conclusion and findings

The present study was an attempt to know if brand preference has an impact on consumer satisfaction via consumer attitude as a mediating effect. Hence after running an analysis it can be concluded that consumer satisfaction has a direct relationship with brand preference but when consumer attitude act as a mediator between them it accounted for significant and practically meaningful proportion of variance between brand preference and consumer satisfaction. The ability of positive or negative attitude results in increase and decrease of brand preference and consumer satisfaction.

## Managerial effect

The study will be useful for the managers in formulating marketing strategies for their company. The findings of the study will give an insight knowledge of the effect of consumer attitude on consumer satisfaction and brand preference helping managers to understand in depth consumer behavior towards brands. This will help the managers to formulate effective strategies that will help them to position their brands name in the mind of the consumers. Overall, benefiting the company, helping them in giving competitive edge to their rival companies and maintaining a good relationship with their consumers.

## Limitations and Future scope of the study

The study is subjected limitations. Firstly the study is limited to Dehradun further the same study can be

carried out on pan India as it will provide proper insight to the marketer. The model proposed in this research is about brand and consumer relationship. The focus has been made on the effect of consumer attitude on consumer satisfaction and brand preference. The factors like brand experience which has an effect on forming consumer attitude should be considered with this in the future study we can also study the gender as a moderator integrating with mediator because the attitude of both male and female towards brand differ which could also have impact on brand preference as well as their satisfaction.

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# A Study on Financial Performance Analysis of Selected IT Companies of India

Krupa Raval, Yashasvi Rajpara

## ABSTRACT

*In this era of digitalization information technology plays a vital role in the economic development of the country. As it's a part of service sector of India and there is eye catching contribution of service sector and more of information technology sector in the GDP of India and the percentage of contribution are growing year by year too so, determination of financial health in terms of profitability and liquidity of the information technology companies is need of hour and in addition to it Indian economy has faced significant changes like demonetization and introduction of GST etc. in near past so, it also encourages to conduct such kind of research and carry this research paper which evaluates the financial performance in terms of liquidity and profitability for the period of five years from 2017 to 2021, of selected three IT companies namely TCS, Infosys and Wipro which are big players of this particular Indian IT sector.*

**Key Words:** IT Companies, Profitability, Liquidity.

## INTRODUCTION

In the year 1967, TATA group of industries looked towards the IT sector in India and took first step by establishment of Tata Consultancy Services in Mumbai which was partnered by Burroughs in the year 1977 and got started with the export of IT services to the other companies. If we take note about software development companies then it was first established in the year 1973 named as SEEPZ which is currently known as IT Park and operating in Mumbai and became the biggest software exporter in the year 1980.

There are mainly two different operating components of the IT industry in India which are business process outsourcing service providers and Information Technology Service providers. Within the last 25 years marvelous growth has been noted in the IT sector of India. Contribution of the IT sector in Indian GDP was 1.2 percent in the year 1998 which has grown to 7.7 percent in the year 2017 and around 8 % in the year 2020 which is a really noticeable increment. Around 4.36 million people are holding jobs in the IT sector. The IT sector is one of the sectors of Indian Economy which are gaining the highest amount of Foreign Direct Investment in India. In last two decades it has attracted foreign investment of around 37.23 billion American dollar in accordance with the data released by Department for Promotion of Industry and Internal Trade

## REVIEW OF LITERATURE:

**Gupta S. and Jain A. (2020)** have carried a research paper on financial analysis of IT companies in India. The basic objectives of this paper was to measure profitability, liquidity, activity and solvency along with analyzing risk return patterns of these companies. For which they have focused on different market segments of the IT Industry in India and done in depth analysis on the basis of statistical data issued by varying statistical institutions.

**Bhatt Vishal J. and Raiyani Jagdish R. (2019)** have carried out research on financial performance analysis of IT Companies. Researchers have selected top ten IT companies on the basis of market capitalization and analysis has been done for the years 2014-15 to 2018-19. Profitability and Liquidity has been measured and compared by using various ratios. They have concluded that HCL has good profitability and TCS has overall return condition and in terms of liquidity all the companies are in ideal condition.

**Dave Ashvin R. and Shah Devanshi R. (2018)** have carried out research on financial performance of companies in the IT sector of India. The five companies were selected on the basis of market capitalization. The variables viz Sales, Profit After Tax, Long Term Debt To Equity, Interest Coverage, Working Capital, Debtors Turnover and Cash holdings of the companies were examined over a period of 10 years. The study revealed that all these companies have performed well in terms of Sales and Profit After Tax. All the companies except Tech Mahindra are consistent in their performance on various parameters.

**Bhargav Pramod (2017)** has conducted research on financial analysis of IT Industries of India. In which researcher has selected two companies, Wipro and Infosys. Researchers have taken a period of five years and five ratios for the same. Researcher has found out that in comparison to Wipro,

Infosys was performing well in terms of finance.

**Pavithra K and Kirubadevi S (2016)** undertook a study to examine the performance and profitability position of selected five IT sectors, namely, IBM, Microsoft, Oracle, SAPSE and Symantec for a five years study period from 2010-11 to 2014-15. The researchers used ratios like liquidity ratios, profitability ratios, solvency ratios and statistical tools like mean and correlation. The research evidence was that Oracle and Microsoft showed outstanding financial performance when compared to other companies.

**Shenbagam Kannappan (2015)** undertook a study on Financial position and Performance Analysis with special reference to Tata Consultancy Services for a study period of five years from 2010-2011 to 2014-2015. The researcher used various Accounting and Statistical Techniques like ANOVA, Coefficients, ratios like Liquidity ratios, Solvency and Profitability ratios. The study evidence was that, "Tata Consultancy Services" Liquidity and Solvency position were considered satisfactory.

#### **RESEARCH METHODOLOGY**

This research is a kind of analytical research in which financial performance of selected IT Companies is determined in the terms of liquidity and profitability.

Researchers have selected the top three IT Companies on the basis of market capitalization named TCS, Infosys and Wipro by using a convenient sampling method. This study is based on secondary data available from annual reports of companies, research papers, articles and moneycontrol.com and financial performance analysis is done for the period of 2016-17 to 2020-21. For analysis researchers have used ratio analysis and for which Net profit Margin, Return on Capital Employed, Return on Net Worth, Current Ratio, Quick Ratio and for testing hypothesis single factor ANOVA test is utilized.

#### **OBJECTIVE OF THE STUDY**

1. To measure financial performance of selected IT Companies of India.
2. To analyze and compare liquidity position of selected IT Companies of India.
3. To determine and compare profitability of selected IT Companies of India.

#### **HYPOTHESES OF THE STUDY**

$H_{01}$ : There is no significant difference in Return on Capital Employed of Selected IT

Companies of India

$H_{02}$ : There is no significant difference in Current Ratio of Selected IT Companies of India.

### **FINANCIAL PERFORMANCE ANALYSIS**

#### **1. NET PROFIT MARGIN**

(In Percentage)

Year	TCS	Infosys	Wipro
2016-17	25.51	23.30	17.72
2017-18	25.92	26.08	17.27
2018-19	24.40	20.11	15.82
2019-20	25.33	19.66	17.22
2020-21	22.77	21.00	20.00
Average	24.786	22.03	17.606

**Source:** www.moneycontrol.com

Above table is showing Net Profit Margin of all three selected IT Companies for the period of five years 2016-17 to 2020-21. It can be seen that, the average net

profit margin of TCS is 24.79%, Infosys is 22.03% and Wipro is 17.61%. There is the highest net profit margin average of TCS out of all the three companies.

## 2. RETURN ON CAPITAL EMPLOYED

(In Percentage)

Year	TCS	Infosys	Wipro
2016-17	38.43	27.80	22.61
2017-18	42.00	31.00	23.87
2018-19	51.80	31.38	20.44
2019-20	57.46	31.28	23.62
2020-21	57.03	32.23	27.49
Average	49.344	30.738	23.606

Source: www.moneycontrol.com

Above table is showing Return on Capital Employed of all three selected IT Companies for the period of five years 2016-17 to 2020-21. It can be seen that, the average return on capital employed of TCS is 49.34%,

Infosys is 30.74% and Wipro is 23.61%. There is the highest return on capital employed average of TCS out of all the three companies.

## 3. RETURN ON NET WORTH

(In Percentage)

Year	TCS	Infosys	Wipro
2016-17	30.31	20.31	17.47
2017-18	33.27	25.44	18.27
2018-19	38.10	23.44	15.41
2019-20	44.72	24.97	18.68
2020-21	41.39	25.23	2.23
Average	37.558	23.878	14.412

Source: www.moneycontrol.com

Above table is showing Return on Net Worth of all three selected IT Companies for the period of five years 2016-17 to 2020-21. It can be seen that, the

average return on net worth of TCS is 37.56%, Infosys is 23.88% and Wipro is 14.41%. There is the highest return on net worth average of TCS out of all the three companies.

## 4. CURRENT RATIO

(In Proportion)

Year	TCS	Infosys	Wipro
2016-17	3.09	4.05	3.52
2017-18	2.85	3.78	2.86
2018-19	2.84	3.00	2.96
2019-20	1.97	2.88	2.78
2020-21	1.78	2.74	2.50
Average	2.506	3.29	2.924

Source: www.moneycontrol.com

Above table is showing the Current Ratio of all three selected IT Companies for the period of five years 2016-17 to 2020-21. It can be seen that, the average

current ratio of TCS is 2.5, Infosys is 3.29 and Wipro is 2.93. There is the highest current ratio average of Infosys out of all the three companies.

## 5. QUICK RATIO (In Proportion)

Year	TCS	Infosys	Wipro
2016-17	2.93	4.05	3.50
2017-18	2.67	3.78	2.84
2018-19	2.74	3.00	2.94
2019-20	1.89	2.88	2.77
2020-21	1.69	2.74	2.50
Average	2.384	3.29	2.91

Source: www.moneycontrol.com

Above table shows the Quick Ratio of all three selected IT Companies for the period of five years 2016-17 to 2020-21. It can be seen that, the average

quick ratio of TCS is 2.38, Infosys is 3.29 and Wipro is 2.91. There is the highest quick ratio average of Infosys out of all the three companies.

## RESULTS OF HYPOTHESES TESTING

### 1. RETURN ON CAPITAL EMPLOYED

Anova: Single Factor

#### SUMMARY

Groups	Count	Sum	Average	Variance
TCS	5	246.72	49.344	76.00643
Infosys	5	153.69	30.738	2.90812
Wipro	5	118.03	23.606	6.54273

#### ANOVA

Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	1765.822	2	882.9111	30.99482	1.81996E-05	3.885294
Within Groups	341.8291	12	28.48576			
Total	2107.651	14				

Source: Researcher's Calculation

Single factor ANOVA has been conducted to compare Return on Capital Employed of three companies for the period of five years. An analysis of variance showed that difference is significant,  $F(2,12) = 30.99$ ,  $p = 1.82$ .

$H_{01}$ : There is no significant difference in Return on Capital Employed of Selected IT Companies of India  
 $F > F_{crit} (30.99 > 3.89)$  So, Null hypothesis is rejected.



## 2. CURRENT RATIO

Anova: Single Factor

### SUMMARY

Groups	Count	Sum	Average	Variance
TCS	5	12.53	2.506	0.34633
Infosys	5	16.45	3.29	0.3431
Wipro	5	14.62	2.924	0.14028

### ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.538893	2	0.769447	2.782105	0.10169881	3.885294
Within Groups	3.31884	12	0.27657			
Total	4.857733	14				

**Source:** Researcher's Calculation

**Source:** Researcher's Calculation

Single factor ANOVA has been conducted to compare the Current Ratio of three companies for the period of five years. An analysis of variance showed that difference is not significant,  $F(2,12) = 2.78, p = 0.10$ .

$H_{02}$ : There is no significant difference in Current Ratio of Selected IT Companies of India

$F < F_{\text{Crit}} (2.78 < 3.89)$  So, Null hypothesis is accepted.

### FINDINGS AND SUGGESTIONS

- There is the highest average Net Profit Margin of TCS in comparison to other companies.
- There is the highest average Return on Capital Employed margin of TCS in comparison to other companies.
- There is the highest average Return on Net Worth of TCS in comparison to other companies.
- There is the highest average Current Ratio of Infosys in comparison to other companies.
- There is the highest average Quick Ratio of Infosys in comparison to other companies.
- On the basis of hypothesis testing it has been found out that there is significant difference in return on capital employed of all three companies while there is no significant difference in the current ratio of selected companies.
- It can be suggested that Infosys and Wipro should focus more on enhancing profitability by maximum possible efforts and techniques of cost cutting and it can also be recommended to TCS

and Wipro that they should think about improving the liquidity position of the company as Infosys is maintaining.

### CONCLUSION:

On the basis of research carried out by researchers it can be concluded that the IT sector is playing a significant role in real terms for encouraging Indian economy. On the basis of analysis it can be summarized that in terms of profitability TCS is doing well while in terms of liquidity Infosys has shown noticeable benchmarks. For more detailed outcomes it is recommended that prospectus researchers should go for analyzing financial performance of IT Companies by taking more samples and different techniques of analysis and testing.

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# Hybrid Intelligent System for Credit Card Fraud Detection

Priti Srinivas Sajja, Kamini Shah

## Abstract

*This paper discusses a hybrid intelligent system for credit card fraud detection using novel co-operative neuro-fuzzy hybridization. The paper introduces the scenario and discusses work done in the domain so far with the limitations of the existing solution. To meet the gap a hybrid neuro-fuzzy system is proposed with generic architecture, fuzzy membership functions, sample fuzzy rules, and a neural network dealing with fuzzy parameters in order to classify the credit card transaction into valid, invalid or undetermined categories. Training as well as testing data sets of the neural network are also provided with necessary technical details. Further, the paper also discusses fine tuning of the output of the neural network with help of fuzzy component. Comparative evaluation, advantages and other experimental details with output screens are included in the paper. The architecture proposed in this work is generic enough and can be applied to many domains. Some example domains and advantages are also presented in this paper. The paper concludes the possible future enhancement in the research work such as big data, deep learning and type 2 fuzzy logic with type reducer.*

**Key Words:** credit card fraud, Hybrid Neuro-Fuzzy Systems, Neural Network, Fuzzy Membership Function, Fuzzy Rules

## 1. Introduction

E-commerce have become a biggest source of business in last few decades as it is achieving speedy growth and have significant impact across the globe. But with every new phenomena there comes a restriction that makes it less attractive. Fraud is such type of restriction for E-commerce. Some of the major types of frauds in a business are Identity theft, financial fraud, bribery, mortgage fraud, embezzlement, tax fraud and securities fraud to name a few (Spevack Law Firm, 2018). Detection and reporting of such frauds have become an essential requirement. To understand credit card fraud one must understand the word 'fraud'. As per Oxford English Dictionary's definition frauds is "wrongful or criminal deception intended to result in financial or personal gain." (Oxford Dictionaries, 2019).

As per The Companies Act, 2013 [SEC 447]'s definition "Fraud in relation to affairs of a company or a body corporate, include any act; any omission; concealment of any fact, or abuse of position committed by a person or any other person with the connivance in any matter with intent to deceive, to gain undue advantage from or to injure the interest of the company, its shareholders, its creditors or any other person whether or not there is any wrongful gain or any wrong loss (Ministry of Corporate Affairs, 2013).

Credit card theft (one of Identity theft) have become critical issue as 21st century is becoming an age of digitalisation as it involves theft of identity or information from your card. In present year on 19<sup>th</sup> October state bank of India blocked nearly 6 lakh debit card due to a reported malware-related breach in non-SBI network which was reported as one of the largest financial breach in India as 32 lakh debit cards from 19 banks were involved. According to National Payments Corporation of India (NPCI) more than 640 customers lost 1.3 crore in fraudulent transactions from 90 ATMs (Dave, 2018).

Following are the ways in which fraudsters commit credit card frauds.

**Lost or stolen card:** Lost or stolen card fraud is the easiest way a fraudster can acquire a card. In this type of fraud, the card is lost or stolen from card holder without any investment in technological gadget.

**Account take-over:** When a fraudster obtains valid cardholders personal information illegally and contacts related bank to report card as lost to acquire new card on the name of the valid customer.

**Counterfeit cards:** In this type of fraud, fraudster 'clones' the card with the help of electronic device to duplicate the chip of card. Various techniques such as erasing the magnetic strip, creating fake card, altering card details, skimming, white plastic copy etc. are included in this type of fraud.

**Application fraud:** When a fraudster uses the valid customer's information to apply for credit card and obtains such fraud in called application fraud. Other: various other credit card frauds are also in practice that includes never received, multiple imprints, collusive merchant and email order/telephone order fraud. (Mastercard, 2014)

## 2. Review of Literature

Jain et al, 2019 conducted a research on "A Comparative Analysis of



Various Credit Card Fraud Detection Techniques” to identify the success rate of the various credit card fraud detection techniques and to find out which one has the most optimum result in finding fraud. The techniques were evaluated and compared on the basis of qualitative measures that includes accuracy, precision and false alarm matrix. The study revealed that none of the techniques that were researched could find all the frauds completely as the detection of the frauds were identified after the fraud were committed and not when the frauds were being committed. Researchers recommended that there should be a hybrid network is to be prepared to get a model of detecting credit card fraud that can analyse big set of data with less expenses to reduce the limitation of the existing fraud detection data (Jain, Tiwari, Dubey, & Jain, 2019).

Elsayed, 2017 studied “Predictability of Financial Statements Fraud ( Red Flags)” with the objective to add information to the current fraud-detection literature by applying statistical analysis the Benford’s law and data-mining techniques to a company’s financial ratios and to examine the relationship between the changes in a company’s financial ratios (fraud indicators) and the probability of FSF (Financial Statement Fraud) of the US public companies listed in the US Security Exchange Commission. The point-biserial correlations’ results revealed significant correlations between the probability of FSF and the financial ratios of sales to accounts receivable (SAL\_AR), days inventory outstanding (DIO), cash conversion cycle (CCC), total liabilities to total assets (TL\_TA), board of directors’ size (BOD\_SZ), and board of directors’ independence (BOD\_IND). Similarly, the T-test revealed significant differences between the mean of these financial ratios among fraud and non-fraud samples. The decision tree, logistic regression, Benford’s law, and the neural networks models had correctly predicted 89%, 91%, 92%, and 99.2% respectively of the fraud and non-fraud cases; and therefore could be used as fraud-predictive tools (Elsayed, 2017).

Totaetal, 2016 in their study “THE USE OF BENFORD’S LAW AS A TOOL FOR DETECTING FRAUD IN ACCOUNTING DATA” examined various Transactional data to detect unusual transactions, amounts, or patterns of activity in selected samples. The objective of this study was to check if the expected frequencies of the digits are in accordance with the accounting data. This data set contains 2,963 records, all greater than or equal to 100 ALL. The result could be helpful for auditors to detect and prevent fraud and misrepresentation in financial

statements (Tota, Aliaj, & Lameja, 2016).

West et al, 2015 in “Intelligent Financial Fraud Detection Practices: An Investigation” investigated various financial fraud detection techniques using various data mining techniques with special reference to computational intelligence-based techniques. The study classified the techniques on the basis of the practices for detection algorithms, types of fraud investigated and rate of successfully detecting fraud is considered. The study revealed that financial fraud detection faces several challenges such as typical classification problems, categorization of fraud and which method to apply for fraud detection, privacy considerations, computational performances, modified techniques of fraud, disproportionate misclassification of cost and non- availability of generic frame-work. Results shows that CI methods of detecting fraud were showing increased which ultimately leads to an effective way to defeat the evolved tactics of fraudsters (West, Bhattacharya, & Islam, 2015).

Sitienei, 2012 in his research project “Factor influencing credit card fraud in the Banking sector

–The case of Kenya commercial bank Mombasa County, Kenya” conducted a survey with qualitative data as well as quantitative data with the variables such as credit card skimming, technology, system securities, proper card management and system integration that influence credit card fraud. The study revealed that said variables indeed influenced the credit card frauds as there were found to be significant as per chi-square statistics and were a major contributing factor in credit card fraud (Sitienei, 2012).

Chaudhary and Mallick, 2012 studied “Credit card fraud: The study of its impact and detection techniques” with an aim to analyze the cost that incurred in credit card fraud detection with reference to data mining techniques. Study revealed that each of data mining technique are costly and have certain pros as well as cons which leads to an upsurge need to develop a modified version of fraud detection model that can give assurance to prevail the fraudulent activities from happening (Chaudhary & Mallick, 2012).

Detamaire et al, 2009 conducted a study on “Credit card fraud and detection techniques: A review” and described various types of credit card fraud which includes bankruptcy fraud, theft(counterfeit) fraud, application fraud and behavioral etc. from past published study and have suggested several techniques for fraud detection which includes decision



tree approach, genetic algorithms and other algorithms, clustering techniques and neural networks which can help banks in detecting and preventing credit card frauds in future (Delamaire, Abdou, & Pointon, 2017).

Brause et al, 1999 in "Neural Data Mining for Credit Card Fraud Detection" studied the data mining techniques with symbolic data, analog data and combination of both data set. The result of mining algorithm for symbolic data were obtained from 5,850 fraud transactions and 30,000 legal transaction were considered which showed that the more non-generalized rules researchers takes the better result can be obtained. The result of mining the analog data was based on symbolic part of the transactions which were obtained from 250 legal and 250 fraud data which showed that different diagnosing behavior as the proportion of legal to fraud was changed. The result of combined symbolic and analog data set showed that decision based on analog data could override the rule based experts. Overall study result resulted that with the help of an automatically generated rule system, researchers could manage to increase the inherent correct diagnosis of 99.90% to 99.95% which includes analog data set (Brause, Langsdorf, & Hepp, 1999).

As credit card are used widely in many doamins on global commercial platforms, it is very iomportant to identify and prevent fraud for benefit of consumers and other stack holders. Many solutions are availble to identify such fraud possibilities, however they use standard non- intelligent appacorch, hence not in a position to gain the advantages of the intelligent approach. Further, existing artificial intelligence based solutions have some limitations too, when used in stand alonf manner as mentioned in Sahin, Y., & Duman, E. (2011) and Sajja and Aherkar, (2012). Following section enlists need of a hybrid intlligent approach using modern artificial intelluigent techniques and presents a generic architectuire of the system.

**3. Neuro-Fuzzy Systems for Credit Card Fraud Detection: Architecture and Experiment** For effective detection of validity of credit card and related financial operations, here a hybrid intelligent system is designed and experimented. Systems which employ only artificial neural network can learn from data, however they do not allow imprecision and vagueness in its

parameters as well as further fine tuning. Systems developed with fuzzy logic technique do not offer

virtue of self learning. To gain dual advantages of the artificial neural network and fuzzy logic, a hybrid approach is to be used (Sajja and Akerkar, 2010). Both these techniques can be hybridized in concurrent manner, co-operative manner and pure hybrid manner. In concurrent neuro-fuzzy hybridization both the components, i.e. neural network component and fuzzy logic based components are simultaneously working. In case of co-operative hybridization output of one can be refined by the other and vice versa. In pure hybridization, typically, either the activation functions of the neural network are fuzzy, or fuzzy membership functions / other parameters are learned by an artificial neural network.

Here we are using improved co-operative hybridization. This system uses fuzzy component as an input/output interface. This provides a facility to input vague values while interacting with system. Once user provides the details related to the commercial transactions and credit card being used, the data are validated traditionally during initial phase. Here typical operations such as sending data to acquiring bank, basic checking of users and card data, etc. are carried out and acknowledgment from the bank is demanded. There are some data which are not crisp in nature, but vague and uncertain. Such data should be entered in to the system via an interactive editor along with other crisp data. Besides the transaction details, card details and other related financial details, users' data are also to be collected and stored in the users' profile. In users' profile also some of the parameters are fuzzy. After collecting valid users as well as card details, along with the transaction details, features are needed to be extracted via feature extraction technique. Feature such as user's age, gender, income, neighborhood, frequency of the online transactions, amount of the transactions, etc. are extracted and sent to the trained neural network. As a neural network typically works with crisp and normalized values, it is required to convert such fuzzy values into their equivalent non-fuzzy values via respective fuzzy membership functions. The underlying artificial neural network classifies the transaction into three categories namely: 'Valid', 'Invalid', and 'Undetermined'. Again fuzzy logic based component fine tunes the output of the neural network. The fuzzy membership functions used by the input editors are also defined and stored here. Hence, fuzzy logic enhances input as well as output mechanisms of the designed system. Figure 1 describes the architecture of the system. Figure 2 provides some fuzzy membership functions used in the system.

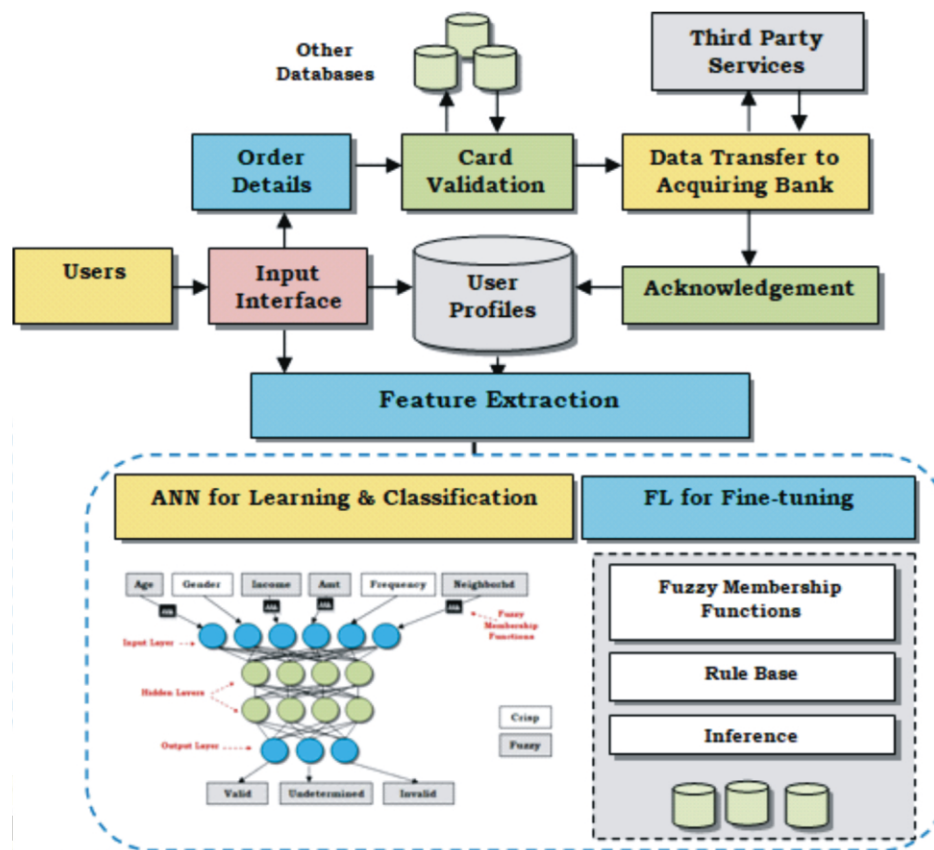


Figure 1: Architecture of the Hybrid Intelligent System for Credit Card Fraud Diagnosis

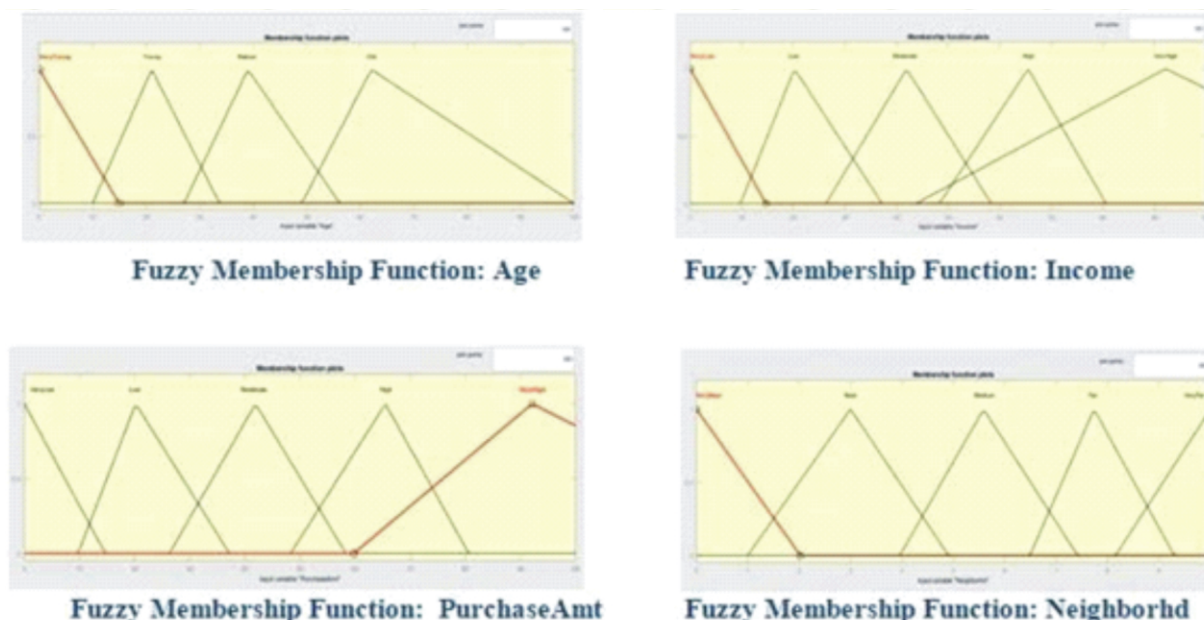


Figure 2: Sample Fuzzy Membership Functions

The underlying neural network encompasses an input layer, output layer and 2 hidden layers. Figure 3 describes the structure of neural network.

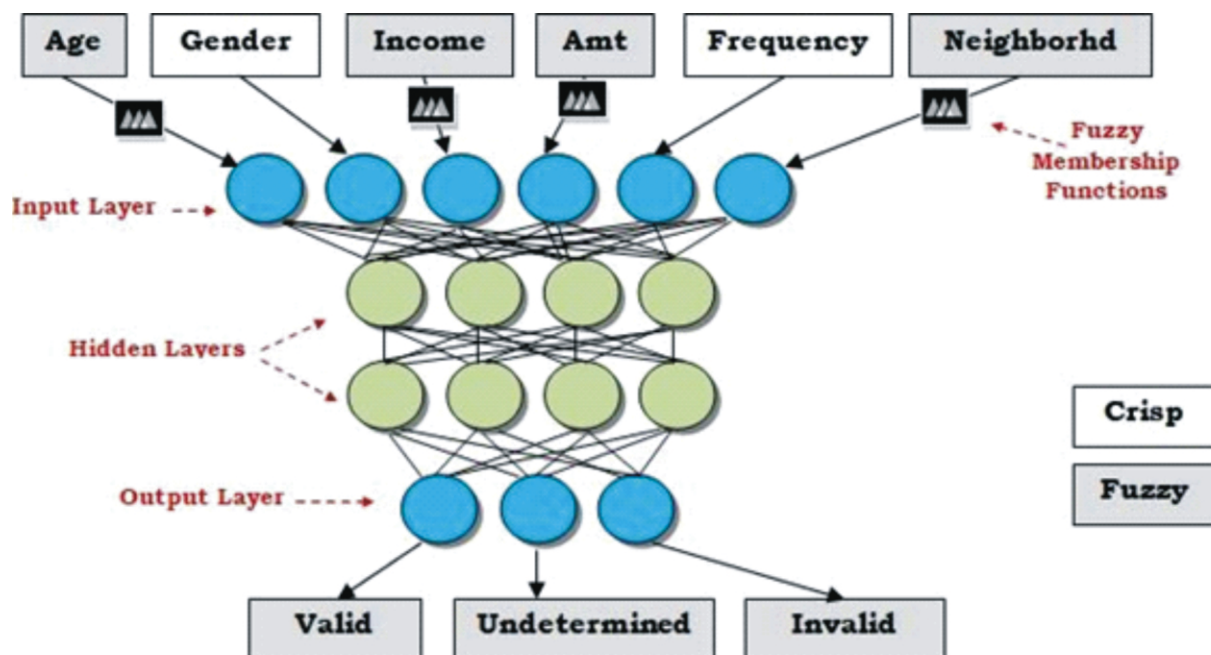


Figure 3: Structure of Artificial Neural Network

The neural network shown in the figure 3 considers data such as age, gender, income, purchase amount, frequency of purchase and area of purchase. As shown in figure 3, some of the parameters are fuzzy in nature. Corresponding fuzzy membership functions are

developed and already described in figure 2. The neural network takes derived features and classifies the given transaction into three categories. The training data sets of the above network are given as shown in table 1.

Table 1: Sample Training Data

Sr. No	Age (Fuzzy)	Gender	Income (Fuzzy)	Amt (Fuzzy)	Freq	Neighborhd (Fuzzy)	Valid	Undetermined	Invalid
1	YY	0	HH	LW	6	NN	1	0	0
2	VY	0	LW	LW	2	NN	0	1	0
3	OO	1	HH	LW	5	FF	1	0	0
4	MM	1	MM	MM	7	NN	1	0	0
5	MM	1	LW	HH	4	VF	0	0	1
6	YY	0	LW	HH	5	FF	0	0	1
7	MM	1	HH	MM	4	NN	0	1	0
...	...	...	...	...	...	...	...	...	...

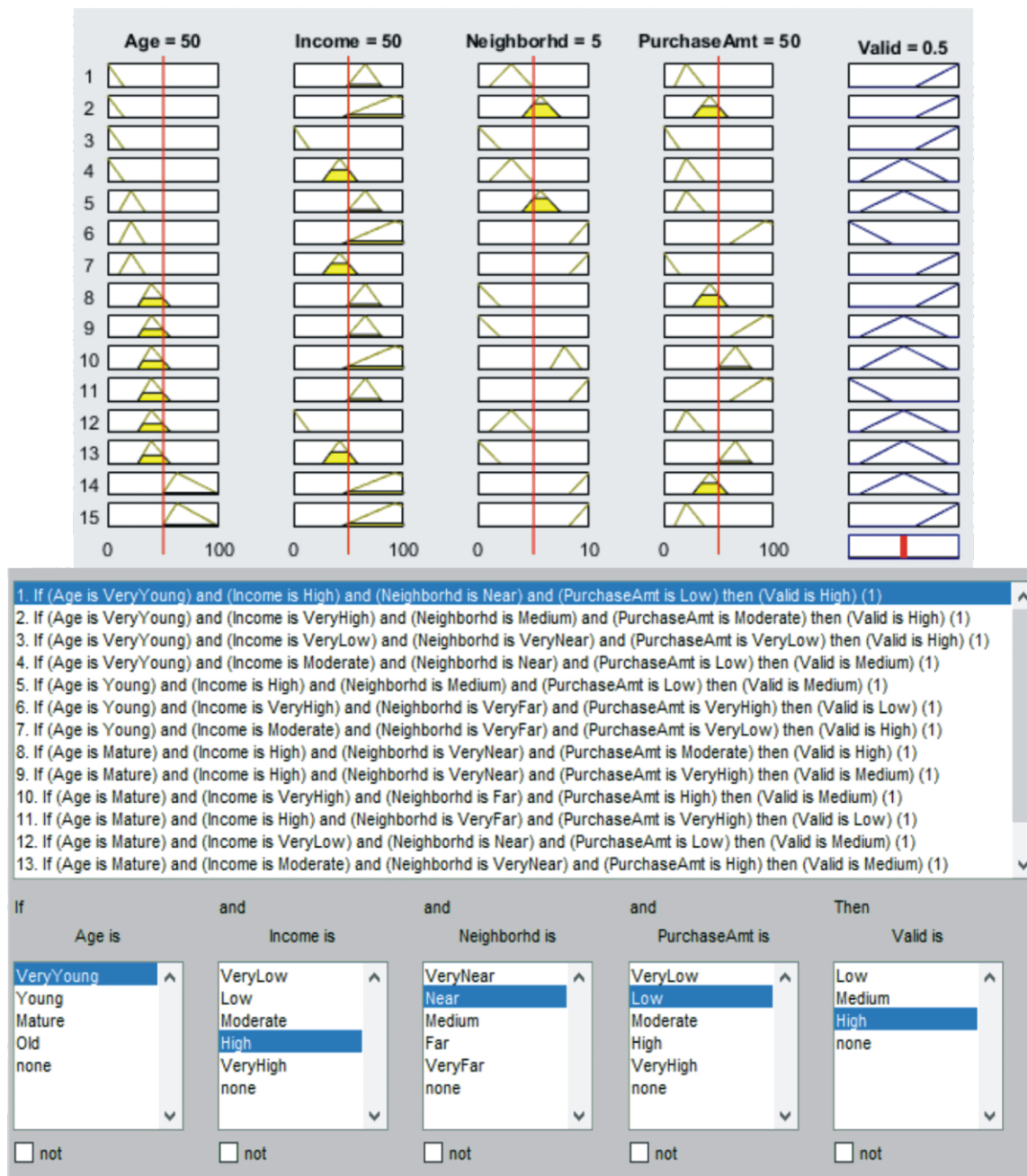
The neural network of the system is provided two sets of data. One set is for training and other for testing & validation. The neural network needs to be trained once only with valid data.

The outputs of the network are further

elaborated with help of fuzzy logic based component of the system. There are several rules developed and used for further clarification and decision making. Some of these rules are demonstrated in figure 4.

Figure 4: Example Fuzzy Rules in Editor





#### 4. Discussion

In this system, it is taken care that parameters which are theoretically and typically considered by such credit card verification system are included. Besides, the parameters normally being overlooked by the designers are also included in the designed system. Traditional systems do not consider vague and fuzzy parameters like large amount of purchase, matching gender and age with purchase item and quantity, etc. With the help of fuzzy module incorporated into the system, such parameters are easily included in the decision making process. Neural network learns from data provided, which are related to various valid and realistic situations and domain heuristics. Some examples of such domain heuristics are as follows.

- Women, young and very old people are easy target of the credit card fraud.
- Large proportion of the credit cards used for fraud are likely to be newly issued (fresh) and of disposable kind. On similar card no frequent transaction are observed generally.
- Products involved in frauds are very typical and generally have great resale value so as to be converted into money easily.
- Products quantities are abnormal or purchased on maximum installments.
- Visible and unreasonable change in location of purchase.
- Purchase of product that cannot be correlated to user's profile.



- Very frequent purchase from various sites and stores. etc.

Many such situations are kept in mind while designing the training/testing data and fuzzy rules for the system presented in this paper. Further, creditability and reliability of any neural network based system depends on its training. For training of the systems neural network, separate sets of data for training and validation are used. Table 2 demonstrates the

efficiency of the learning via the network. Here we have considered two features called 'True Positive' and 'False Negative' for the evaluation. The 'True Positive' is the rate that the predicted output is "Valid" class when the desired output is "Valid" class. The 'False Negative' is the probability of which the predicted output is "Invalid" when the desired output is "Valid" class. The desired system will have a high 'True Positive' and a low 'False Negative'.

Table 2: Efficiency of Training and Test Data Sets

No. of Rules	Training (%)			Testing (%)		
	TP	FN	ERR (Training)	TP	FN	ERR (Testing)
5	37	16	47	35	25	40
10	42	15	43	34	21	45
15	44	19	37	41	15	44
20	47	17	36	45	11	44
25	63	14	23	59	9	32

Figure 5 shows learning efficiency and error in the neural network employed for the experiment. It is clearly visible from the figure 5, the 'True Positive' is

increasing and 'False Negative' is decreasing for both training as well as test data sets.

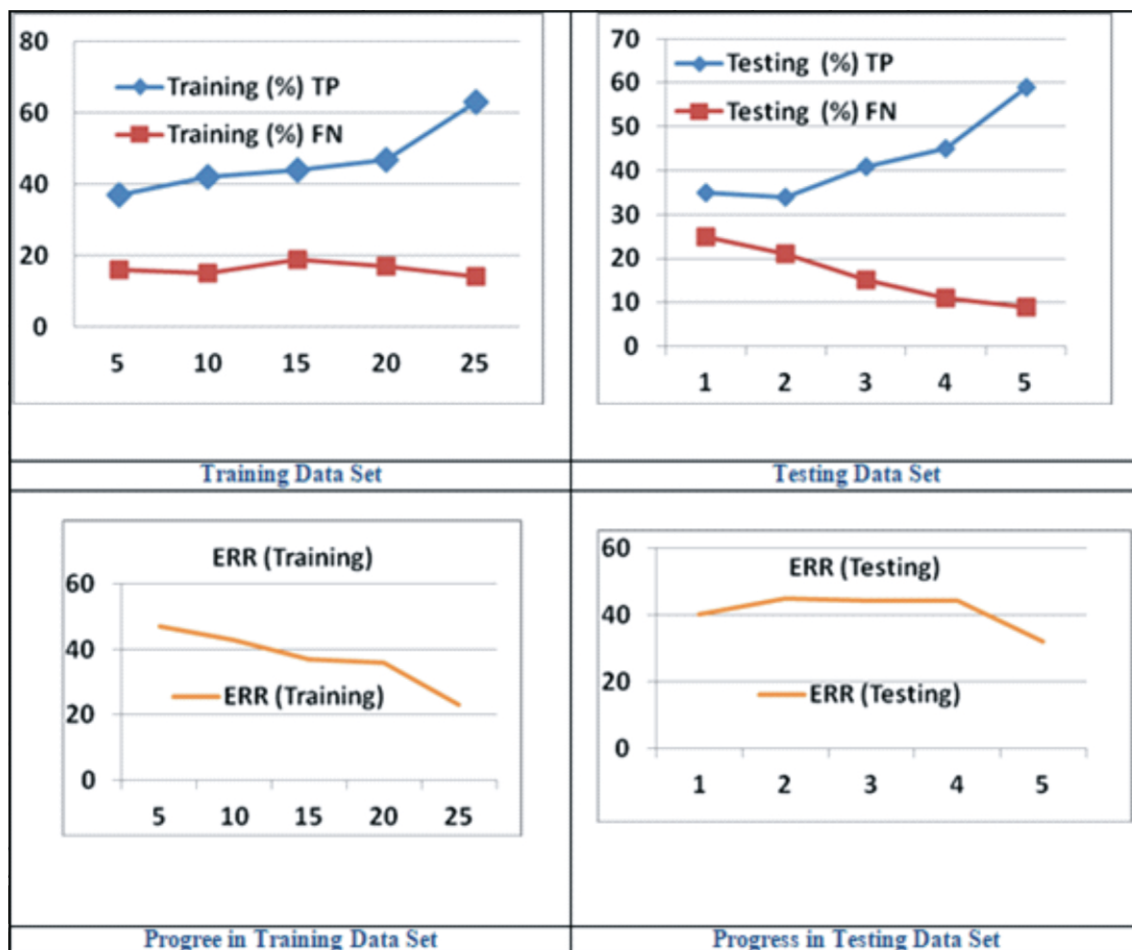


Figure 5: Evaluation of Learning in Neural Network

The system designed and experimented here is a kind of co-operative hybridization of artificial neural network and fuzzy logic. The self learning related advantages are achieved by the neural network; Inference, fine tuning of neural network results and uncertainty handling are managed by fuzzy logic component. In addition, users can interact with the system in fuzzy manner through in input/output editor. Being a hybrid intelligent system, it offers advantages such as intelligent decision making and problem solving, proactive manner of working, and intuitive working. Traditional system are not adaptive enough for new type of frauds, on other hand, the hybrid intelligent system presented here can identify suspicious credit card operations in advance. As there are no or poor legal support is available in cyber crime and e-commerce, prevention of such fraud is only better way.

## 5. Conclusion

In this experiment, ecommerce domain is selected and neural network as well as fuzzy functions/rules is designed for identifying and preventing credit card frauds. To conduct experiment, a few parameters are selected, however many more parameters can be considered along with possible encryption of the CVV at client side. Here, the architecture designed for this research work is generic in future and can be applied to various domains. Fault finding, malicious financial transactions identification in an organization, network intrusion detection, legal advisory system, etc. are the domains where the architecture is useful without much change. The generic architecture as well as the system for identifying possibility of frauds in credit card operation has got a high commercial value for patenting and marketing.

Further, the system can be easily enhanced to manage big data related to global commercial data handling and fraud detection. On use of deep learning models with hybrid (supervised as well as unsupervised) learning instead of simple artificial neural network, a module of feature selection can be omitted and big data related to the domain can be efficiently handled. The way the designed system handles vagueness and uncertainty can also be enhanced by use of type 2 fuzzy logic based system with an additional component of type reducer and natural language as users input.

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## 'A Study on Employee's Perception on the Impact of Talent Management Practices on employee's performance in Manufacturing and Service Companies'

Lavina Christian, Jitendra K. Sharma

### ABSTRACT:

*Talent Management is a new concept of human resource management which deals with the skilled and talented employees. These talent management practices comprise not just about talent retention at the proper place, but also supporting and empowering talented employees to enhance their skills, knowledge, abilities and performance in a competent way. The Talent Management Practices have significant effect on the employees' performance and organizational performance.*

*The main objective of this research study is to study various talent management practices followed in the manufacturing and service sector companies and impact of talent management practices on employee's performance. This study also focusing on talent management practices followed in large medium and small scale companies. This research study has independent variables size and type of the companies and dependent variables such as Talent Acquisition, Performance management, Leadership skill and development, Career succession planning, Organizational performance, Talent Retention and Reward and Recognition. This research study is descriptive and nature.*

### KEYWORDS:

*Talent Management, Talent Management Practices, Employee's Performance, Talent Retention ,organizational performance*

### INTRODUCTION

There are various research studies conducted to study the talent management practices implemented in various companies. Majority of the researchers have discussed about talent management practices and its effects on organizational performance.

There are some parameters such as career opportunities, employee engagement, effective recruitment and selection process, effective training and development programs can lead to talent management. It is concluded that there is a positive relationship between employee engagement, talent retention, employee performance and talent management. There were 10 essential principles of effective implementation of talent management practice such as compensation management, learning management, performance management, Staffing, employee development and succession planning and also recognition (Abdulquddusmohammed, 2015). There are core principles for implementing world class Talent management. (1) Respect employees (2) Clarify objectives (3) Increase awareness (4) Develop a proactive talent management strategy (5) Accountability (6) business progress Feedback (7) Build adaptable talented skills (8) Performance management system (9) Career succession planning (10) To evaluate potentials talents and experiences. (Prathigadapa Sireesha, leela Krishna ganapavarupa). These 10 essential principles will be extremely useful to understand the entire talent management system. It is concluded that Compensation Management, Employees Performance and career opportunities have connection between employee performance and Talent Management.

### DEFINITION OF THE PROBLEM:

This study entitled "A Study on Employee's Perception on the Impact of Talent Management Practices on employee's performance in Manufacturing and Service Companies" focuses on quantitative assessment of talent management practices in the Gujarat state.

Nowadays there is tremendous competition for talent in today's corporate market. Employers are struggling to find and retain good employees at all levels. Furthermore, employers are caution about compensation, working conditions, welfare facilities. Despite of strengthen market has led to increase employee frustration. If employees are staying with the organization from two to five years, then the employer probably has done what is realistically and necessary to retain employees.

### OBJECTIVES OF THE PROPOSED STUDY:

#### PRIMARY OBJECTIVES:

- To study Talent management Practices followed in manufacturing and service companies.
- To study employee's perception on the impact of Talent management practices on their performance in manufacturing and service companies.

#### RESEARCH GAP:

There have been many research studies conducted on talent management by research scholars and field experts. But after referring these researches it is found that hardly very few comprehensive studies conducted to find



impact of talent management practices on employee's performance. So research gaps are as follows:

In literature reviews, it is found that majority of the researches conducted on various methods to measure employee's performance and organizational growth but very few studies have focused specifically the impact of talent management practices on employee's performance. Employee's performance in connection to Talent management in Indian manufacturing and service sector is still untapped.

#### **SCOPE OF THE STUDY:**

This research on "A Study on Employee's Perception on The Impact of Talent Management Practices on employees performance in Manufacturing and Service Companies" tries to search with the talent management practices followed in the manufacturing and service companies and perception of the employees on the impact of such practices on employee's performance.

#### **ORIGINAL CONTRIBUTION OF THE STUDY:**

This research study is uncommon and original, since very less similar research study has been conducted before. This research study has focused on various Talent Management practices followed in various companies of Gujarat.

#### **VARIABLES:**

##### **Independent Variables: -**

A .Type of Companies

A1 .Manufacturing Companies

A2. Service Companies

##### **Dependent Variables: -**

B1.Talent Acquisition

B2. Leadership and Talent Development

B3. Performance Management

B4. Reward and Recognition

B5. Succession Management/Planning

B6. Talent Retention

B7. Organizational performance

B8.Labor Attrition

B9.Employee Performance

#### **RESEARCH METHODOLOGY**

This research study was conducted in the manufacturing and service industries of Gujarat, India. There are total four questionnaire has been used for the research. Questionnaires developed using likert scale and were filled by HR manager and employees of the companies. The research work is descriptive in nature. The study has focused on understanding the Talent Management Practices followed in the 30 manufacturing and 30 service industries by focusing on total 60 selected industries of Gujarat.

#### **MAJOR FINDINGS OF THE STUDY**

##### **Objective 1: To study Talent Management practices followed in manufacturing and service companies.**

- In Talent Management practices, Majority of the employees said that Talent acquisition practices are seen higher in manufacturing companies than service sector companies.
- In Talent Management practices, Majority of the employees said that Leadership and development practices are seen higher in manufacturing companies than service sector companies.
- In Talent Management practices, Majority of the employees said that Performance management practices are seen same in manufacturing companies and service sector companies
- In Talent Management practices, Majority of the employees said that Reward and recognition practices are seen higher in manufacturing companies than service sector companies
- In Talent Management practices, Majority of the employees said that Talent retention practices are seen higher in manufacturing companies than service companies.
- In Talent Management practices, Majority of the employees said that Succession management/ planning practices are seen in manufacturing companies than service sector companies.
- In Talent Management practices, Majority of the employees said that Organization performance practices are seen higher in manufacturing companies than service sector companies.
- In Talent Management practices, Majority of the employees said that Labour attrition practices are seen higher in manufacturing companies than service sector companies.

##### **Objective 2: To study employee's perception on the impact of Talent Management practices on their performance in manufacturing and service companies.**

- Majority of the employee's perception on the impact of talent acquisition practices in manufacturing companies and service companies are similar.
- Majority of the employee's perception on the impact of leadership and talent development practices in manufacturing companies are higher than service companies.
- Majority of the employee's perception on the impact of performance management practices in manufacturing companies and service companies are seen similar.
- Majority of the employee's perception on the

impact of reward and recognition practices in manufacturing companies and service companies are seen similar.

- Majority of the employee's perception on the impact of succession management/planning practices in service companies are seen higher than manufacturing companies.
- Majority of the employee's perception on the impact of organization performance practices in manufacturing companies are seen higher than service companies.
- Majority of the employee's perception on the impact of labor attrition practices in manufacturing companies are seen higher than service companies.

#### **CONCLUSION:**

In this global corporate world, Industries invest high amount to retain and to improve employee's performance through various talent management practices which can directly increase the organizational performance. This study concludes that Talent Management practice has high impact on employee's performance. Manufacturing industries and service industries follow various Talent Management practices which enhances the employee's productivity level.

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# A Comparative study of CPSE Guidelines and Companies Act 2013 In context of Corporate Social Responsibility with a case of Maharatna Companies

*Shivangini Chaudhari, Rina Dave*

## ABSTRACT

*Corporate social responsibility is a concept that has been around for decades. Concern about firms' social and environmental impact is growing by the day. According to the Companies Act of 2013, only successful companies in the 18th century practiced CSR. Today, corporate social responsibility (CSR) is a hot topic all over the world. Since 2010, all CPSEs in India have been following CSR standards established by the Director of Ministries and Public Enterprises. CSR is a concept that applies to all businesses. The purpose of this research is to determine the differences between the CPSE guidelines and Section 135 of the Companies Act 2013, as well as to assess the impact of CSR on Maharatna Companies under Section 135 of the Companies Act 2013. The problem is studied using only secondary data, which is analysed using percentage, average, and "paired t-test" for testing the hypothesis that there is no significant difference in the amount to be spent on CSR activities as per section 135 of the Companies Act 2013 and the CPSE guidelines.*

## 1. INTRODUCTION

Since the late 1800s, corporations have engaged in philanthropy. In the early 1900s, certain socially responsible firms took on a new shape. In the 1950s, the concept of corporate social responsibility was primarily viewed as a business's responsibility to society, and it was through CSR that they were able to reach their full potential. As a result, they took CSR seriously. The general public liked the concept of CSR in terms of goods and services, giving rise to the concept of CSR. CSR refers to a company's commitment to its shareholders to conduct business in a transparent, ethical, and economically, socially, and environmentally sustainable manner. Under section 135 of the Companies Act 2013, the Director of the Ministry of Heavy Industries and Public Enterprises has released CSR guidelines that must be implemented by all CPSEs beginning April 1, 2014. CSR is relevant to all Indian businesses.

The purpose of this study is to determine the impact of CSR u/s 135 of the Companies Act 2013 on Maharatna Companies' commitment to CSR.

## 2. REVIEW OF LITERATURE

**Richa Gautam and Anju Singh (2010)** assessed the CSR practices of India companies. The top 500 organisations were included in their research study to analyse and appraise CSR activities. Their research looked into how Indian businesses view and carry out their corporate social responsibility. The study reveals that CSR is part of top-level strategy, and that companies use CSR to promote their brand. According to a research, only 271 of the top 500 firms fulfil their CSR obligations. Only a few of the 271 companies were organised and established to cope with CSR operations.

**Athma and Yarragorla (2015)** studied the major differences between CPSE Guidelines and Sec. 135 of Company Act 2013 and the impact of CSR as per Sec.135 of new Company Act 2013 on Maharatna Companies for the period from 2011-14. They came to the conclusion that Maharatna companies' CSR responsibility is more or less equivalent under the CPSE Guideline and Sec. 135 of the Company Act 2013, and that Sec. 135's CSR provision is more flexible than the CPSE Guideline on CSR.

**Laura (2014)** investigated the CSR practises of two Maharatna corporations . (SAIL) and (NTPC), as well as one Miniratna firm, viz. The Airport Authority of India (AAI) conducted research on the social and economic development of rural people and concluded that these rural development CSR programmes have a major impact on the company's and society's overall growth.

## OBJECTIVE

1. To compare the actual contribution of CSR by Maharatna Companies.
2. To identify and analyse the impact of CSR on Maharatna Companies as per Companies Act 2013
3. To know the practices of CSR of Maharatna Companies.

#### 4. METHODOLOGY

1. The research was conducted solely on the basis of secondary data. Annual reports of Maharatna companies are among the secondary sources.
2. The time frame was set at three years, namely 2016-17, 2017-18, and 2018-19. The amount to be spent on CSR activities in a year is determined by the average profits of the previous three financial years. As a result, the research period begins in 2017.
3. Maharatna, Navaratna, Miniratna I, and Miniratna II are the four types of CPSEs. Maharatna firms are among the top ten CPSEs, with significant autonomy in making decisions through their boards of directors. For the purposes of this study, the ten Maharatna Companies are listed below.

1. Bharat Heavy Electrical Ltd.(BHEL)
2. Coal India ltd.
3. Gas Authority of India Ltd.(GAIL)
4. Indian Oil Corporation Ltd.(IOCL)
5. National Thermal Power Corporation Ltd.(NTPC)
6. Oil and Natural Gas Corporation ltd.(ONGC)
7. Steel Authority of India Ltd. (SAIL)
8. Power Grid Corporation of India Limited (PGCL)
9. Hindustan petroleum Corporation limited(HPCL)
10. Bharat Petroleum Corporation Ltd.(BPCL)

#### 5. HYPOTHESIS OF THE STUDY

**H0:** There is no significant difference in the amount to be spent on CSR activities as per CPSE guidelines and section 135 of Companies Act 2013.

**H1:** There is a significant difference in the amount to be spent on CSR activities as per CPSE guidelines and section 135 of Companies Act 2013.

#### 6. ANALYSIS AND INTERPRETATION OF DATA

##### 6.1 APPLICABILITY OF CPSE GUIDELINES ON CORPORATE SOCIAL RESPONSIBILITY: MAHARATNA COMPANIES

According to the CPSE Guidelines on CSR and Sustainability, CPSEs must spend a portion of their net profit on CSR operations. Because Maharatna firms' net profit after tax (PAT) exceeds Rs 500 crores, they must spend 1% to 2% of their profit on CSR activities from April 1, 2013, as per modified CPSE criteria.

##### 6.2 APPLICABILITY OF SECTION 135 OF COMPANIES ACT 2013: MAHARATNA COMPANIES

Companies are required to spend money on social responsibilities under section 135 of the Companies Act of 2013. The fulfilment of any one of the following three requirements is required for the applicability of section 135 of the Companies Act 2013:

- (1) Net worth to be Rs.500 Cr or more in a financial year.
- (2) Turnover to be Rs. 1000 Cr or more in a financial year.
- (3) Net profit to be Rs. 5 Cr. or more in a financial year.

According to the Companies Act of 2013, if any of the aforementioned conditions are met, the firm must spend 2% of its average net income over the previous three financial years on CSR.

**Table no.1**

**CPSE CSR Guideline 2013 vs. CSR under Companies Act 2013**

Point of difference	CPSE Guideline on CSR	CSR as per Companies Act 2013
To Whom applicable?	To all the CPSEs.	To all the companies which registered with Registrar of Companies.
Applicable from	From 1 <sup>st</sup> april 2013. Now mandatory to spend on CSR as per Companies Act 2013 effect from 1 <sup>st</sup> april 2013	Effect from 1 <sup>st</sup> april 2014
Condition	Should have profit during the FY(i.e 2018-19)	Should have made profit of 5 Cr. Or more or a Net Worth of Rs 500 Cr or more, or Turnover of Rs 1000 Cr or more in current FY
Scope	Only CPSEs Companies include.	Mandatory for all the Companies.



Amount to be spent	If PAT is Rs < 100 crores: 3% to 5% If PAT is > Rs 100 crores < Rs 500 crores: 2% to 3% If PAT is > Rs 500 crores: 1% -2%	2% of the average profits of the preceding three financial years
CSR Activities	Policy approved by their board	The schedule cover 10 points. (Annexure 1)
Time Limit	Unutilized budget for CSR activities planned for a year will not lapse and will, instead, be carried forward to the next year. A maximum two years is available to spend, otherwise transfer to 'Sustainability Fund'	The amount has to be spent within a year. If not spent, the reasons are to be disclosed
Committee	Board level committee will assist the Corporate Social Responsibility policies	CSR Committee's formation is mandatory

Source: CSR Guidelines: CPSE Vs Companies Act 2013

**Table no:2**  
**CSR liability as per CPSE Guidelines and under U/S 135 of Companies act 2013**  
**Amt in Cr.**

CPSE	CPSE Guidelines	Companies Act 2013	Difference
BHEL	24.3078	16.78	7.52
BPCL	142.64	154.31	(11.66)
CIL	209.39	228.41	(19.01)
GAIL	120.51	94.31	26.20
HPCL	120.57	123.96	(3.38)
IOCL	337.88	382.31	(44.42)
NTPC	234.99	209.84	25.15
ONGC	534.31	430.41	103.90
PGCL	198.77	171.32	27.45
SAIL	43.57	0	43.57
Total	1966.97	1811.65	155.32
	Paired 't' calculated value	1.21	
	Paired 't' critical value	2.26	
	Sig. (2-tailed)	0.26	
	Level of Significance ( $\alpha$ )	0.05	

Table 2 illustrates corporate social responsibility, according to MHIPE's CPSE guidelines 2013 and U/S 135 of the Companies Act, 2013. The CSR obligation of all 10 Maharatna firms is established in accordance with the CPSE standards and in accordance with Annex I and Annex II, section 135 of the companies Act 2013, respectively. In accordance with CPSE norms and up to Rs. 1811.65 crore, as per article 135 of the Companies Act, 2013. According to section 135 of the Company Act 2013, Maharatna companies overall profit spend on CSR activities is lower than CPSE's Corporate Social Responsibility.

According to the CPSE recommendations and Section 135 of the Companies Act, 2013, corporate social responsibility is defined as: The liability of BHEL, GAIL, NTPC, ONGC, PGCL, and SAIL CSR after the adoption of U/S 135 is less than the CPSE standards, according to table 2. On the other hand, increased

potential CSR obligation for BPCL, CIL, HPCL, and IOCL when compared to CPSE guidelines.

Companies Act 2013 has a lower liability towards CSR than the CPSE guidelines. This discrepancy resulted from differences in the two guidelines. According to CPSE guidelines, companies must spend 2% of their profits from the previous financial year on CSR. According to the Companies Act of 2013, 2% of the average profit of the three prior fiscal years is taxed.

It is now necessary to determine whether the difference in CSR obligation for Maharatna enterprises is statistically significant. To determine the importance of the distinction between CSR liability as defined by the CPSE guidelines and U/S 135, The 'paired't' test is carried out. The calculated value of paired't' is 1.21, while the critical value of paired't' is

2.26. Here, from the table conclude that the paired 't' value is less than level of significance. So, null hypothesis (H<sub>0</sub>) "There is no significant difference between amount to be spend on Corporate Social Responsibility by Maharatna companies as per CPSE guidelines and Section 135 of Companies Act 2013" is accepted.

## 7. CONCLUSION

According to the CPSE Guidelines, the amount spent on CSR activities is calculated on the basis of the previous year's net profit, whereas the amount spent on CSR activities under the Companies Act 2013 is determined on the basis of the previous three years' net profit. The guidelines of the CPSE are less flexible than the Companies Act of 2013. The liability of BHEL, GAIL, NTPC, ONGC, PGCL, and SAIL CSR after the application of U/S 135 is found to be lower than that of the CPSE guidelines. However, when compared to CPSE rules, there is an increase in possible CSR obligation for BPCL, CIL, HPCL, and IOCL.

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### Annexure-I: CSR Liability as Per CPSE Guidelines

Amt in Cr

CPSE	2018-19	2%
BHEL	1215.39	24.30
BPCL	7132.02	142.64
CIL	10469.67	209.39
GAIL	6025.67	120.51
HPCL	6028.66	120.57
IOCL	16894.15	337.88
NTPC	11749.89	234.99
ONGC	26715.79	534.31
PGCL	9938.55	198.77
SAIL	2178.82	43.57

**Annexure-II: CSR Liability U/S 135 of Companies Act 2013**

					<b>Amt in Cr</b>
<b>CPSE</b>	<b>2018-19</b>	<b>2017-18</b>	<b>2016-17</b>	<b>AVG PROF</b>	<b>2%</b>
BHEL	1215.39	806.60	495.86	839.28	16.78
BPCL	7132.02	7976.3	8039.30	7715.87	154.31
CIL	10469.67	9293.42	14499.09	11420.72	228.41
GAIL	6025.67	4618.41	3502.91	4715.66	94.31
HPCL	6028.66	6357.07	6208.80	6198.17	123.96
IOCL	16894.15	21346.12	19106.4	19115.55	382.31
NTPC	11749.89	10343.17	9383.26	10492.10	209.84
ONGC	26715.79	19945.26	17899.98	21520.34	430.40
PGCL	9938.55	8238.96	7520.15	8565.88	171.31
SAIL	2178.82	-481.71	-2833.24	-378.71	-7.57

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# The Mediating Role of Consumer's Attitude on Selected Brand Parameters and Purchase Intention - A Study on Agri Food Brands

Sudip Kundu, Chitra Bagchi

## Abstract

*The retailing sector of agricultural food products has flourished hugely down the years in this decade. But the fact remains that the cross section of the retailing sector stays unorganized and divided in fragments, courtesy mushrooming of front liner supermarket chains as well as booming of retailing business online. The overall attitude of the consumers has undergone a change also. They demand for food with superlative quality and health-value. With the passing of time, customers' cravings for branded items are gaining momentum. Consequently, the leading retailers are keeping branded products in their shops to draw the interest of the customers. So, it has become a moot point to grasp pulse of the market by making out the proper parameters of branding so as to manipulate the formation of customer-attitude as well as purchase intention of the consumers. For the purpose of identification and selection of the units of test, method of quota sampling is resorted to 240 numbers of samples were collected for the pilot study. West Bengal presidency was selected for collection of data. For analysing the relationship, confirmatory factor analysis along with structural equation modelling were applied. The software used for the study is SPSS AMOS 21. This paper seeks to explore the function of customers' behaviour regarding the brands while analysing the property of mediating relationship*

**Keyword:** Agri food brand, Brand awareness, Brand image, Brand association, Purchase intention, mediating role, consumer attitude, Structure Equation Modelling (SEM) and Confirmatory factor analysis (CFA).

## INTRODUCTION

The boom in the retailing sector which is organized, rising number of the middle-class, a sizeable disposable earning, some desire to experiment with new items- all these have contributed demand for branded agro -food items in the marketing scenario of India. Kundu and Kar (2012) are of the opinion that the enormous size of populace, increasing domestic food-product markets, fruits and vegetables (F and V products) which are perishable and not branded, as well as the food industry with private labels were trying to attract Indian customers. Steenkamp (1997) feels that value can be added to agro-food products by dint of resorting to branding. He further considers that branding helps differentiating products as well as to dodge risks in the competitive price market. Busch and Bain (2004) underscored the fact that retailing industry is fast growing global and assuming an oligopolistic character to form individual brands. This enables positioning of products as also makes the consumer-communication easier. The capacity to build a customer base, making the customers aware about suitable attributes while inciting eagerness to buy a brand-product once/many times Van Trijp et al. (1997). Previous researched focused on origin or region of origin of a product Brooker et al. (1988), market-entry order as well as cost of promotion – Nijmeijer et al. (2004), quality factor Barcala and Diaz (2006), how reliable and trustworthy is a brand -Hanfand Kuhl (2005), judgement by the consumers based on sensory capacities Kuhar and Ti (2008), loyalty of the customers D'silva and Bhuptani (2010); Ercis et al. (2010); image of stores, quality based on consumer perception, attitude of the consumers Fischer (2009), perception of the value Ercis et al. (2010), strategy of branding health products Chrysochou (2010), building identity of a brand, product-standard, safety factor of food products, traceability - Ali et al. (2010); Canavaro, et al. (2010)– these are key factors that impact the dimensions in branding of agro-food products therefore regulating the retailing industry in agro-food sector. Keller and Lehmann (2005) threw light on the factor of profitability in the matter of the sale of generic branded products in establishing the consumer value to a retailing concern. Battacharyya (2012) accepts the growing craze among the customers about branded items- be it local, national or global brands. This, in turn is paving the way for the corporate with enormous scope for pushing the retailing business. Ushering in of agricultural foods that are processed by brands has provided the branding itself with an edge Stanton et al., (2005). Nair (2011) showed that private brands or for that matter specific store-brands are thriving in the markets of India.. The burgeoning of private label brands (PLBs) seems pretty satisfactory as far as grocery and food industry is concerned despite the popularity of top manufacturing labels on the national level. Wettstein et al. (2009) dealt with the perception of the customers to the private labels while analyzing the opportunity in building loyalty of the customers. Their research scaled the nuances between the repurchasing attitude of the customers and private brands. All the same, repurchasing attitude not necessarily creates the importance of loyalty towards a brand.

## LITERATURE REVIEW

Hislop (2001) refers to the term 'brand' as a string of attributes which helps achieving contentment and also helps in relationship-building. Keller

(2003) deems brand as either a logo or a name or a symbol for that matter. Brand is used as a means for identifying the products of a certain seller, easily differentiated from the other contenders in the field Aaker (1991). Abrahams and Granof (2002) felt 'brand's to be a connection of a consumer with a service or some goods depending entirely on efficacy as well as on consistency. Therefore the brand is a relationship between the goods and the service Weilbacher (1995). The brand forms a favourable image Kotler (2000).

**Brand Awareness:** This is a method to initiate the customer parley with a commercial concern. Keller (2003) described brand awareness to be the consciousness of the consumer about the brand- by dint of which the consumer can remember and identify the brand as well as can link the brand product to the brand name, its logo or a certain recollection about the brand itself. According to Aaker (1996) the most desired level of awareness can be achieved through recollection and recognition. All the same, acquaintance with an idea about brands is really special characteristics. Scales like 'knowledge' Aaker (1996), 'familiarity with the brand' Aaker (1996), Netermayer et al. (2004), 'recall' Aaker (1996), 'remembrance' Keller (2001), Walgren et al. (1995), and 'recognition' Walgren et al. (1995) we're devised after much analysis.

**Brand Image:** According to Chernatony & McWilliam (1989) 'brand image' is a design which is identified, a sort of emblem which guarantees efficacy of the product while providing necessary commercial data so as to enable customers making buying decision. Do the brand image is something that helps in recognising specific products and forms a kind of brand belief Kotler (2000). Now, Dobni & Zinkhaml (1990) opined that fundamental concept of the customer is how to form a judgement about a brand which is subjective in nature. The judgement may be sensational or even emotional. Naturally, a popular brand kindles interest in consumers and in this way evokes desire for a purchase simply because the image of the brand provides the consumer with a feeling of security, comfortability and trustworthiness Kamins and Marks (1991), Laroche, Kim, & Zhou (1996). The study included these scales, viz. "uniqueness" Kim & Kim (2004), perception" Kim et al. (2003), "identity" Hsieh (2002), association" Esch et al. (2006) and "reliability" Chang and Chieng (2006).

**Brand Association:** This incorporates all kinds of assets as well as responsibilities that are attached to a brand while those factors are linked with the customer's memory Aaker (1991). Consumer memory includes feelings, perceptions, emotions, expectations, behaviour, beliefs and recollections

Kotler and Keller (2006). This is associated with all sorts of data nodes which are related to the consumer's memory and this act as an aid to govern buying decision through collection, arrangement and retrieval of data which are based on the said associations. Chen (2001) classified brand associations into two types –one is product associations, the other is organizational associations. Aaker; (1991), Kotler and Keller (2006), Keller; K. L. (2003) identify personality, attributes of the product, competitors, benefits derived by the consumers, and place of origins to be key major constituents of brand association. Dimensions of scales have been derived subsequently: a positive feeling which is actually a value on the emotional level Sweeney & Soutar (2001), the beneficial value which is convenience Kim and Kim (2005), personality values which are respect Kim and Kim (2005) and being consistent Yoo et al. (2000) and then the differentiation product benefit Kotler & Keller (2006).

**Consumer's attitude towards agri-food brands:** Consumer's behaviour is an influencing factor regarding the purchase intention for buying agricultural food items Chaniotakis et al. (2010). Consumer's behaviour includes faith on the food quality, image of the product, acquaintance with the product, reliability, fiscal condition of the buyer and the beneficial aspect that is perceived by the consumer. Consumer's intrinsic recollection of the previous buying experiences as well as purchasing experience and extrinsic recollection of data about a brand regulate the process of buying significantly Bettman (1979). Conroy (2010) was of the opinion that the consumers prefer unbranded products while having a bootstrap budget in that they choose to go frugal with that budget. Once the economic condition gets sound, obviously they will go for the branded food products. The consequent scale dimensions are – a comprehensively favourable performance by the brand Batra & Stayman (1990); Kuo Ming Chu (2018); a lifestyle that is healthy De Matos et al (2007); Kuo Ming Chu (2018), Aertsens et al (2009); Thogersen et al. (2017); Tarkiainen & Sundqvist (2005); a choice that is more suitable than other preferences De Matos et al (2007); Kuo Ming Chu (2018), trustworthiness, reliability and uniqueness Kuo Ming Chu (2018).

**Purchase Intention:** Purchase intention is the impulsion of the customer working behind the decision to purchase a brand product. Purchase intention is comprised of such constructs as a deliberation over purchasing a brand as well as a hope to buy one buying a brand. When the customer intends to purchase a particular brand because of its certain properties, similar properties impel the customer to purchase other brands too. The resultant scale dimensions are – an interest in a brand and therefore



consideration for purchasing the brand *Holzwarth et al. (2006)*, *Kuo Ming Chu (2018)*; a wise decision making while purchasing a brand *Magnusson et al. (2001)*; *Tarkiainen and Sundqvist (2005)*; *Paurav.S (2011)*; a desire to purchase at a reasonable price *Thogersen and Olander (2006)*; *Paurav.S (2011)*; *Netemeyer et al. (2004)*, *Kuo Ming Chu (2018)*; receiving positive feedback *Paurav.S (2011)*; *Netemeyer et al. (2004)*, *Kuo Ming Chu (2018)*.

*Brand Dimensions and its impact on Purchase Intention:* *Malik et al. (2013)* stated that in the service field brand awareness is positively associated with loyalty. On the other hand, *Yaseen et al. (2011)* found an important connection among brand awareness, quality of the product perceived by the consumer and loyalty upon profitability of the brand along with buying intention. *Hsin Kuang Chi et al. (2009)* worked on the manufacturers of cell phones with a view to identify the impacts of brand awareness, buying intention and perceived quality. *Hsin Kuang Chi et al. (2012)* dealt with the roles of the endorsing authority, image of the brand, promotion of the product price on the buying intention. *Latwal GS & Sharma RK (2009)*, *Irshad. W (2012)*, *Naeini et al. (2015)* analysed the function of the model described by Aaker to establish that brand equity is positively related with buying intention.

*Consumer's attitude towards agri-food brands as a mediating factor to purchase intention:* So far as the choice of food is concerned, previous studies have favourably or disfavorably evaluated the consumer behaviour or consumer attitude as mediating issue *Kuo Ming Chu (2018)*. Purchase intention includes the probability factor of a consumer's certain behaviour whereas consumer attitude acts significantly as the crucial predictor of overall perceivable behaviour. Previous researches have explored the fact that the attitude of the customer generally has a positive impact on the buying intention regarding the purchase of food items. *Sheeraz et al. (2016)* tried to explore the connection between credibility of a brand and buying intention. They found a mediating role of the customer attitude. *Gabisch JA & Gwebu KL (2011)* studied the mediating function of formation of attitude on buying intention in a mixed cultural scenario. *Abdul, A et al. (2015)* worked on the gamers playing avert game and found a positive mediating function that attitude play on buying intention. They also discussed the effect of attitude on the congruity of self-brand as well as on entertainment. *Jaafer et al. (2012)* showed how attitude has an effect on buying intention of food items of private brands. *Yang et al. (2014)* studied in a Chinese set-up to explore the effects of attitude on buying intention of organic food items and hypothesis of his study revealed a positive mediating role. *Wee et al. (2014)* endeavored to develop the 'theory of

planned behaviour' with regard to the organic food products and revealed that here too attitude is positively related with buying intention and buying behaviour. *Juharsah & Hartini (2014)* dealt with the weavers' group at Bau – Bauin, the island of Butonto explore the way attitude mediates on the issues like knowledge of products and ethnocentric behaviour. *Ruowei Wang (2009)* summed up that consumer attitude and buying intention are directly related to each other and act as significant factors which influence the buying of greens.

## **OBJECTIVES**

- To test the role of the identified brand parameters on purchase intention of agri food brands.
- To study the role of mediation of consumer's attitude towards agri food brands on brand parameters and purchase intention

## **RESEARCH METHODOLOGY**

This study has been done with the objective in recognizing a sample that is representative of the population that is accepted for the purpose of the study. The criteria for the selection were also in the context of the population. No random selection process was taken up. Therefore sample with non-probability was taken into consideration. A sub-group that is mutually exclusive was formed. For identification and selection of the unit or the population, districts used for segment, quota sampling was resorted to. It is to mention that the selection of the segment was done based upon a specific proportion, i. e. a cross section of the population represented as a percentage share. Overall 240 numbers of samples were taken up for the purpose of study. Data collection was done in the following districts which fall into the presidency division of West Bengal- North 24 Parganas (n=89, 37%), Kolkata (n=38, 16%), South 24 Parganas (n=70, 29%) and Howrah (n=43, 18%), 37%). The respondents were given a set of questions in view of the effects of certain brand-dimensions on buying intentions. A questionnaire based on 5-point Likert Scale was used for data collection (strongly agree: '5', strongly disagree - '1'). Intercept interviews were conducted at supermarkets and malls at specified places. The Hypothesis to be tested is H<sub>1</sub>: Brand parameters constructs and its influence on attitude towards brand; H<sub>2</sub>: Brand dimension constructs and its influence on purchase intention and H<sub>3</sub>: Consumer's attitude towards brand and its mediation role towards purchase intention.

## **BRAND PARAMETERS IMPACTING AGRICULTURE BRANDS**

*Model measurement:* SPSS AMOS 21 was used to conduct the confirmatory factor analysis. The measurement scale denotes, NFI =.935, RFI =.925, IFI =.976,



TLI =.972, CFI =.976 and RMSEA =.048. The frameworks used for this analysis had high internal consistency, as all items loaded on their respective latent variables as significant [ $p = .000$ ] factor loadings  $\geq .80$  Hair et al., (2008). The test's measurement model had high psychometric convergent validity, as well as construct reliability and average variance explained (AVE). The following are the construct reliability (CR) values: 0.94 for awareness, 0.92 for image, 0.93 for association, 0.93

for attitude and 0.91 for purchase intention. All of the CR levels remained inside acceptable bounds of 0.70 Hair et al., (2008). The AVE values are 0.76 for awareness, 0.70 for image, 0.71 for association, 0.77 for attitude and 0.72 for purchase intention, the minimum standard maintained as recommended of 0.50 Hair et al. (2008). As part of discriminant validity, the derived AVE scores were again tested and compared to the MSV and ASV.

Construct Validity						
Construct	Convergent Validity			Discriminant Validity		
	Construct Reliability (CR)	Average Variance Explained (AVE)	Recommended Level Hair et al. (2008)	Max Shared Variable (MSV)	Avg Shared Variable (ASV)	Recommended Level Hair et al. (2008)
Awareness	.94	.76	CR > .70 AVE > .50 CR > AVE	.30	.27	AVE > MSV  AVE > ASV
Image	.92	.70		.38	.23	
Association	.93	.71		.38	.24	
Attitude	.93	.77		.68	.28	
PI	.91	.72		.68	.31	

## ROLE OF BRAND PARAMETERS ON CONSUMERS ATTITUDE TOWARDS BRAND

H<sub>1</sub>: Brand parameters constructs and its influence on attitude towards brand

The study objective entails how those brand dimensions influence customer perceptions of agri-food products. The effect of selected brand dimensions, such as recognition, image, and association, on customer attitudes toward agri food brands is investigated using a multiple linear regression test. The model assumptions and validity checks relating to 'test of linearity' Williams, Grajales & Kurkiewicz (2013), 'test of constant error variance' homoscedasticity Cohen et al. (2003), 'test of independent error terms' - autocorrelation Montgomery, et. al (2001), 'test of normality of the variables' Field, Andy (2009) and 'test of

multicollinearity' Dan Liao and Richard Valliant (2012) were done and all data fits the recommended level. Consumer attitudes toward brand recognition, image, and association were predicted using multiple linear regression analysis. The regression indicating that the model was a significant predictor, with predictor variables explaining 56.4% of the variance [ $F(3,236) = 36.723, p < .05$ ] with an  $R^2 = .318$ . Respondents predicted attitude towards brand is equal to  $1.082 + 0.202 \text{ brand awareness} + 0.021 \text{ brand image} + 0.456 \text{ brand association}$ . So respondent's attitude increased 0.202 for awareness, 0.021 for image and 0.456 for association. It was found that brand awareness ( $\beta = 0.198, p < .05$ ) and brand association ( $\beta = 0.422, p < .05$ ) significantly predicted consumer's attitude towards brand. However, brand image is insignificant ( $\beta = 0.018, p > .05$ ).

Model Summary		Coefficients <sup>b</sup>		Unstandardized Coefficients		Standardized Coefficients	t	Sig	Collinearity Statistics
Regression Statistics		Model		B	Std. Error	Beta			VIF
Multiple R <sup>2</sup>	0.564 <sup>a</sup>	(Constant)		1.082	0.232		4.660	0.000	
R Square	0.318	Awareness		0.202	0.075	0.198	2.702	0.007	1.860
Adjusted R <sup>2</sup>	0.310	Image		0.021	0.087	0.018	.241	0.810	2.037
Durbin Watson	1.942	Association		0.456	0.073	0.422	6.231	0.000	1.585

a. Predictors: (Constant), Association, Image, Awareness, b. Dependent Variable: Attitude towards Brand

A measurement model and a structural model are often used in structural equation modelling. *Measurement model*: It establishes the connection between both the latent variable and its observed. A confirmative factor

analysis of awareness (BA<sub>w</sub>), image (BI) and association (BA<sub>s</sub>) was conducted. The measurement model revealed that latent constructs were well-fitting

- Notes for the model: Chi-square ( $\chi^2$ ) = 169.8, df = 87, p = 0.000; model fit: minimum discrepancy (CMIN/df) = 1.952, NFI = .945, IFI = .973, TLI = .967, CFI = .972 and RMSEA = .063

**Structural model:** It represents the latent variables BAw1, BI, BAs and purchase intention (PI). The model showed the following fit - Absolute model fit: Chi-square ( $\chi^2$ ) = 225.301, p = .000, RMSEA = .048,

GFI = .908; Incremental fit: AGFI = .881, CFI = .979, NFI = .942, TLI = .975 and Parsimonious fit: minimum discrepancy (Chi Square / DF) = 1.543. The result of SEM indicated that awareness and association significantly predicted purchase intention of agri food brands. The linkages between the constructs are as follows:

Hypothesis	Dependent Variable		Independent Variable	$\beta$ Value	t - value	p -value	Decision
H <sub>2a</sub>	Purchase Intention	<-----	Awareness	.413	5.345	.000	Accepted
H <sub>2b</sub>	Purchase Intention	<-----	Image	.076	.880	.379	Not Accepted
H <sub>2c</sub>	Purchase Intention	<-----	Association	.191	2.536	.011	Accepted

### MEDIATION OF CONSUMER'S ATTITUDE ON PURCHASE INTENTION

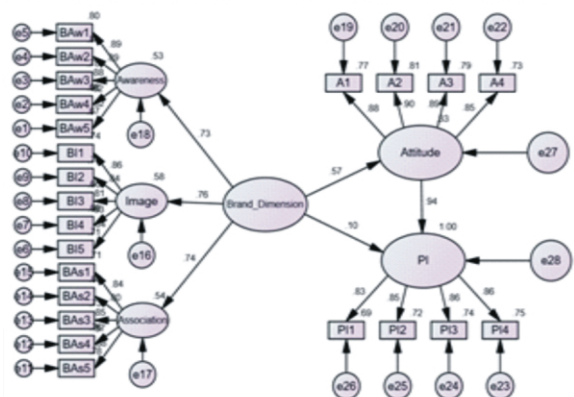
H<sub>3</sub>: Consumer's attitude towards brand and its mediation role towards purchase intention

**Validity of construct** Confirmatory factor analysis was used to evaluate the estimation procedure. The measure of Absolute model fit: Chi-square ( $\chi^2$ ) = 339.913, p = .000, RMSEA = .048, GFI = .892; Incremental fit: AGFI = .865, CFI = .976, NFI = .935, TLI = .972 and Parsimonious fit: minimum discrepancy (CMIN / df) = 1.545 indicate an acceptable model fit Hair et al. (2008). Secondly, the model fit was checked using brand dimensions as a first order correlated model to see if the measurement model was sufficient, and the fit indices were: Absolute model fit: Chi-square ( $\chi^2$ ) = 169.80, p = .000, RMSEA = .063, GFI = .913; Incremental fit: AGFI = .880, CFI = .972, NFI = .945, TLI = .967 and Parsimonious fit: minimum discrepancy (CMIN / df) = 1.972. The validity was then measured using second order reflective constructs for brand dimensions and first order reflective constructs for the three dimensions. The result highlights Absolute model fit: Chi-square ( $\chi^2$ ) = 237.669, p = .000, RMSEA = .050,

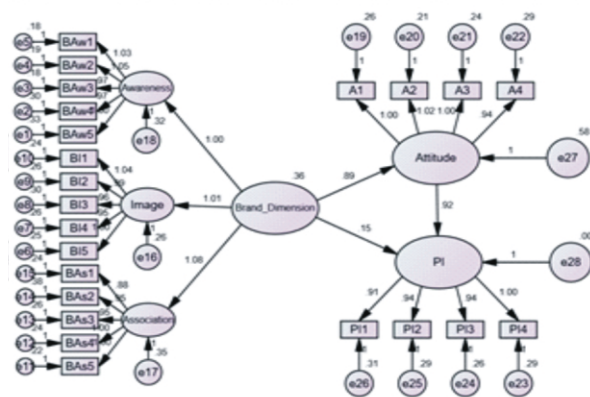
GFI = .903; Incremental fit: AGFI = .876, CFI = .976, NFI = .939, TLI = .972 and Parsimonious fit: minimum discrepancy (CMIN / df) = 1.606. Result indicates the dimensions to fit best as a second-order reflective metric. Hair et al., (2008)

**Hypothesis testing of proposed model:** To test the hypothesis, we tested the full structural model. The model is recursive and the model fit indices are: Absolute model fit: Chi-square ( $\chi^2$ ) = 352.958, p = .000, RMSEA = .049, GFI = .888; Incremental fit: AGFI = .862, CFI = .974, NFI = .933, TLI = .974 and Parsimonious fit: minimum discrepancy (CMIN / df) = 1.576 indicate a reasonable fit. The second – order factor loadings were all significant: brand dimensions to awareness (1.00, p < 0.05); brand dimensions to image (1.010, p < 0.05) and brand dimensions to association (1.077, p < 0.05) Hair et al. (2008). The hypothesis is tested with structural model based on p-value. Structural coefficient is: brand dimensions to attitude ( $\beta$  = .894, t = 6.680, p < 0.05), brand dimensions to purchase intention ( $\beta$  = .152, t = 2.486, p < 0.05) and consumer attitude towards brand to purchase intention ( $\beta$  = .921, t = 0.055, p < 0.05). The result is summarized.

**Proposed Model:**  
**Standardized Estimate**



**Unstandardized Estimate**





Measurement Model Link							
Hypothesis	Dependent Variable		Independent Variable	2 <sup>nd</sup> order Factor loading	t - value	p - value	Decision
H <sub>3a</sub>	Awareness	⊕	Brand dimensions	1.000	-	0.000	Supported
H <sub>3b</sub>	Image	⊕	Brand dimensions	1.010	7.879	0.000	Supported
H <sub>3c</sub>	Association	⊕	Brand dimensions	1.077	7.915	0.000	Supported
Structural Model Link							
Hypothesis	Dependent Variable		Independent Variable	$\beta$ Value	t - value	p - value	Decision
H <sub>3d</sub>	Attitude	⊕	Brand dimensions	.894	6.680	0.000	Supported
H <sub>3e</sub>	Purchase Intention	⊕	Attitude	.921	16.712	0.000	Supported
H <sub>3f</sub>	Purchase Intention	⊕	Brand dimensions	.152	2.486	0.013	Supported

**Mediation test:** The attitude toward the brand is a intermediary variable in our proposed model. In order to test this mediating relationship, the role of independent variable (brand dimensions) on the dependent variable (purchase intention) was studied. Second, the control variables are examined in the context of the intermediary (brand attitude) on the predictor variables. To verify the indirect, direct, and total estimation of the path coefficient, the bootstrapping technique was used. The objective is to

test the nature of mediation, full / partial / no mediation. The influence of the mediating variable on the dependent variable ( $\beta = .921$ ,  $p = .000$ ) is higher than that of the effect of independent on the mediating variable ( $\beta = .894$ ,  $p = .000$ ) and are significant. This refers to the existence of mediation. Secondly in case of the indirect effect of mediation, the standardised indirect effect of the two tailed significance is .001 while the direct effect (no mediation), p value (0.013) < 0.05 signifies the existence of a partial mediation.

Mediation Bootstrapping Result for Consumers attitude towards brand	Value	Sig	Mediation Decision	Conclusion
<b>H<sub>4f</sub>: No Mediation effect:</b>				
Purchase Intention <----- Brand dimensions p-Value < 0.05	$\beta = .152$ $t = 2.486$ 0.013	YES		
<b>Indirect effect of mediation:</b>				
Total effect	.975			
Direct effect	.152			
Indirect effect	.823			
LL: 95% CL	.773			
UL: 95%CL	1.223			
Effect of the brand dimensions on the attitude	.894	YES	Presence of mediation	Partial Mediation
Effect of the attitude on the purchase intention	.921			
Standardized Indirect Effects - Two Tailed Significance (BC)p – Value < 0.05	.001			

## CONCLUSION

With the advent of growing middle class consumption and increase in disposable income, organised retail boom has been a success story. However low involvement of agri food products has been a challenge. The need for branding agri food product is a test for both online food and store based retailers. It is evident that brand awareness and association are significant parameters influencing attitude towards agri food products. Brand image is

not a significant factor which relates to the fact that consumers tend not to involve. It is important for a retailer to design product offering by influencing a mix of awareness and associating consumers to relate with the offering. Branding parameters do influence consumer attitude formation. Therefore retailers on a regular basis should come up with informational content to educate consumers about the utility of using branded agri food products and highlighting factors like convenience, product differentiation and health



factors to associate with the brand. However attitude towards brand plays as a partial mediator in between brand parameters and purchase intention. Thereby we can conclude that branding plays a significant role not only in inducing intention to purchase but also creates a positive attitude towards buying agri food products. Hence modern food retailers should consider in putting more private in store food brands and can formulate strategies in incorporating awareness and try to improve their level of association which in turn would create attitude and buying interest of agri food products.

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# Future Workplace: Leveraging Technology to humanize the Multi-generational Workforce

Divya Jain, Vishal Bhole

**ABSTRACT:** *The increased pace of transformational changes within the business environment compels the organizations to adopt strategies that contribute to its best to utilize the competencies of multi-generational work force to achieve common goals. The purpose of this research is to investigate the level to which the techno-human function will define the future work place in the VUCA world. The research highlights the presence of multi-generational workforce, including the gig workers under a single umbrella & the extent to which technological intervention is leveraged to humanize various categories of employees leading towards a common vision. The research is descriptive & empirical in nature. Primary data of 120 respondents was collected via convenience sampling technique. The primary data was supported by the secondary data to validate the critical findings of the study. Cronbach's alpha & Kolmogorov-Smirnov was applied to test the reliability & normality of the data collected. Data analysis includes the application of statistical tools like simple linear regression applied to test the impact of digital media & automation on workplace transformation & Chi square test was applied to test the independence of multi-generational employees towards transformation. Critical findings revealed that technological intervention has significantly contributed towards civilizing the multi-generational workforce in common parlance.*

**Key words:** *Future of Work, Future Work Place, Technology, GIG work force, Technological Intervention, Multi-generation*

## INTRODUCTION

The present era comprises of multi-generational workforce & varied demographics taking a front seat. The future of work therefore will be derived by these categories. According to a recent research, coming years will experience a significant impact on Indian workplace settings by three primary forces: Change in Demographics, Globalization & Industry 4.0 exponential technological interventions (NASSCOM, FICCI & EY report, 2017). The increasing irrelevance of proximity due to technological interventions also contributes a large extent to the progression of GIG workers as one component of the multi-generational workforce.

India in 2019-20, experiences major disruptions in the job market irrespective of the sector. The prime reason for this disruption is the presence of multi-generational organizations across the developed companies, growing organizations & start-ups competing together under one umbrella. There is definitely a need to work collaboratively and no more working in silo environment would be a value adder in the present scenario.

The reason being every individual in the gig economy has something special on their plate so the opportunity is to learn from each other and customize as per respective needs the world is moving towards specialization. Organizations with an objective, to stabilize the future workplace structures & align it to the needs of multi-generational workforce by remaining competitive are exploring different working patterns which results in amplified utilization of the skilled population in India instead a traditional job environment with a fixed job role. The next few years will experience the transition in the India's Job landscape with the emergence of new engines of job creation (EY, 2017).

Technological advancements are one of the biggest contributors towards the transformation in the future work patterns. The emergence of technological enabled employment opportunities has a positive impact on the GDP rate of India which shows 6% growth in the past five years (World Bank, Govt. of India). With the revolutions in technology, it becomes easier for the independent workers to provide their specialized services on a larger scale irrespective of the location, type of industry & time frame. Innovations in technology has enabled global freelancing & provided freelancers to serve various communities at a faster pace.

In the light of these congruent arguments, the objective of the present study is to find out the significance of technological intrusions & the presence of multi-generation work force including GIG workers to uplift the future workplace scenario within modern-day organizations.

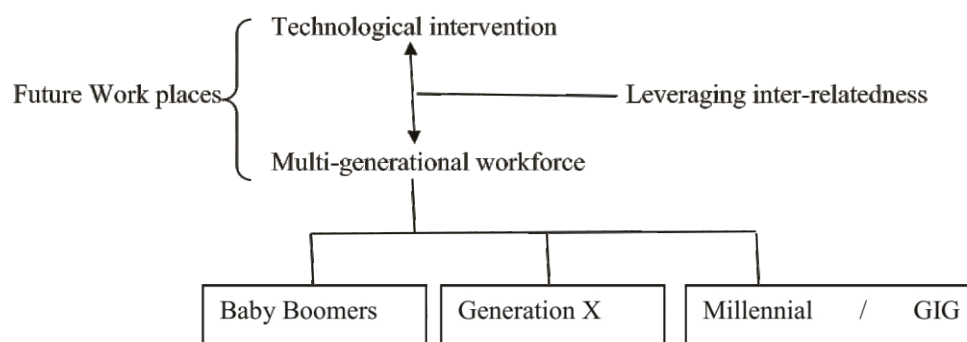
## REVIEW OF LITERATURE

Managing the multi-generational workforce has become a big challenge for many of the organizations (Michael J. Mikitka, 2009). The present day workplaces are experiencing the presence of generations like; baby boomers, generation X & the millennial workforce. A recent research article of Clark, Jane (Nov.19) has highlighted that the traditionalists (born between 1922 & 1945 are just 5 % of the total workforce. On the other note, majority of the workforce in the current era is dominated by the baby boomers, generation X & the millennial which comprises

the gig workers. The focus of many organizations has shifted from managing aging generations to focusing on the multi-generations (Tracey L. Cekada, 2010). Due to frequent technological up gradation in the dynamic business environment; these generations are dominated by the tech savvy people. The work of Sally Kane (April, 2018) has highlighted that millennial forming the majority of the manpower in the future workplaces are more tech savvy, creative & achievement oriented. Hence, it becomes very important for the organizations to synchronize their technological interventions in line with the employee expectations & need. Constant

technological changes require the employees to engage in continuous learning. Different generations can be adaptive with technology by focusing on effective training programs (Cekada, 2012). It has been recorded that 35 % in 1990s have made substantial usage of the practices that brings workplace transformation & adoption of technology that requires high level of skill set is one amongst many (Paul Osterman, 1994). In the similar context, Patricia Wallace in her book "The Internet in the Workplace: How New Technology is Transforming Work" also views that technological innovations just forms one element of workplace transformations.

### CONCEPTUAL FRAMEWORK:



### RATIONALE OF THE STUDY

The present study focuses on investigating the significance of technological intrusions & its acceptance level among the multi-generational workforce. Since the VUCA era of business deals with a blend of different generations performing tasks under a single vision of the company. It becomes necessary for the organizations to modulate its technology to humanize the workforce. This will enable people to enhance task effectiveness in-line with the techno-human function. The technological advancements are ruling the VUCA era & employees being able to sensitize themselves with this change can deliver to the higher level of effectiveness. This research will enable the readers to understand if technology in collaboration with the human interface brings transformation at the workplaces. In a nut shell, multi-generational workforce is the future of the business & technology is the point of locus which will define future work places.

### OBJECTIVE OF THE STUDY:

1. To study the significance of work place transformation among the present day organizations
2. To analyse the impact of technological intervention upon the transformational work places
3. To investigate the influence of multi-generations on the workplace transformation

### HYPOTHESES FRAME

- H01. Digital media support to employees does not impact the transformation at the workplace
- H02. Automated processes does not significantly contribute to work place transformation
- H03. Transformation at the workplace is independent across all generational groups

### RESEARCH METHODOLOGY

**Research design:** The research being descriptive & empirical in nature has adopted systematic research methodology with field survey, sampling design & application of analytical tools. The research, therefore forms a conclusive research design

#### Sampling design:

**Population:** Employees at middle & top level who are actively involved in strategic decision making forms the population of the studies.

**Sampling size:** A total of 131 employees were approached for the survey with a response rate of 91.60 %. Therefore, 120 respondents were considered to carry out the study.

**Sampling Technique:** Convenience sampling technique have been adopted for collecting the primary data

**Data Collection:** The data was collected through: primary & secondary sources, where structured survey



questionnaire was designed & assessed for its reliability & validity. The questionnaire consists of three parts: a) Demographics, b) Workplace transformation c) Technological intervention. The approach adopted to collect the responses includes Google forms & authenticity was checked via speaking to each respondent.

*Secondary sources* of data collection includes a thorough review of recent reports from agencies like

Deloitte, People matters, Mc Kinsey, research papers, research articles & magazines.

**Tools & Techniques:** The data was edited & coded for its reliability analysis. Cronbach's alpha & was applied to test the reliability of the data. **Kolmogorov-Smirnov** was applied to test the normality of the data. Statistical techniques like Chi-square test; simple linear regression was applied to test the hypothesis.

## ANALYSIS & INTERPRETATION

**Table 1**

**Respondents' Profile**

Gender	No.	Percentage	Nature of Job	No.	Percentage
Male	79	65.83 %	Full Time	112	93.33 %
Female	41	34.17	Freelancer	6	5 %
<b>Grand Total</b>	<b>120</b>	<b>100 %</b>	Contractual	2	1.67 %
			<b>Grand Total</b>	<b>120</b>	<b>100 %</b>
Department	No.	Percentage	Generational Group	No.	
Human Resource	39	32.5 %	Baby Boomer	4	3.34 %
Finance	21	17.5 %	Gen X	37	30.83 %
Marketing	23	19.17 %	Gen Y	79	65.83 %
Technology	30	25 %	<b>Grand Total</b>	<b>120</b>	<b>100 %</b>
Other	7	5.83 %			
<b>Grand Total</b>	<b>120</b>	<b>100%</b>			

*Source: Data calculated by the researcher*

Table 1 shows the profile of the respondents which includes gender, generational group, department wise segregation & nature of job. Results depicts that nearly 66 % of the sample constitutes male population & 34 % female. Majority (93.33 %) of the respondents were

full time employees, which requires high use of technology across generational groups. This also demands effective team work to accomplish common goals. There was however, a balance maintained between the departments

**Table 2**

**Descriptive statistics of the variables**

Statistics			
		TI	Average (WPT)
N	Valid	120	120
	Missing	0	0
	Mean	3.40	2.663
	Median	3.67	2.500
	Std. Deviation	.959	.7078
	Variance	.920	.501
	Range	4	3.4
	Sum	408	319.5

*Source: Data calculated by the researcher*

**Reliability analysis**

**Table 3**

**Reliability Statistics**

Variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Workplace transformation (WPT)	.858	.833	10
Technology (TI)	.789	.791	3

*Source: Data calculated by the researcher*

Table 3 depicts the reliability analysis of the data & the values of Cronbach's alpha are .833 for workplace transformation (WPT) & .789 for technological intervention (TI) which is greater than 0.70 (Ipseeta Satpathy,2019) & paved way for reliability of the questionnaire.

Results of Kolmogorov-Smirnov and Shapiro-Wilk with p value above 5 % level of significance show that data set are significantly normally distributed (Table 4)

**Table 4**

**Test for Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Average WPT	.071	120	.200 <sup>*</sup>	.980	120	.068
TI	.208	120	.282	.862	120	.071

a. Lilliefors Significance Correction

b. Ho: Data is normally distributed , retain Null

*Source: Data calculated by the researcher*

**TESTING OF HYPOTHESIS**

*H01. Digital media support to employees does not impact the transformation at the workplace*

**Table 5**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.573 <sup>a</sup>	.328	.322	.5827	.328	57.613	1	118	.000

a. Predictors: (Constant), STDM (IV)

b. Dependent Variable: WPT (DV)

**Table 6**

**Analysis of Variance<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.560	1	19.560	57.613	.000 <sup>b</sup>
	Residual	40.061	118	.340		
	Total	59.621	119			

a. Dependent Variable: WPT (DV)

b. Predictors: (Constant), STDM (IV)

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.738	.151		24.701	.000
	STDM (IV)	.327	.043	.573	-7.590	.000

a. Dependent Variable: WPT (DV)

Source: Data calculated by the researcher

Table 5 generates the R value which shows a moderate relationship between digital media support & workplace transformation. The statistical finding of R<sup>2</sup> shows that transformation in the workplace is explained to the extent of 32.8 % which signifies that there are other factors, other than digital media, contributing to the workplace transformation. Results of ANOVA with p value (.000) < .05 proves that the

regression model predicts the dependent variable significantly well & is a good fit for the data (Table 6). The coefficient table with significance p (.000) < .005 indicates support of digital media significantly contributes to the regression model & thus presents the equation:  $WPT = 3.74 + .327 (STDM)$

H02. Automated processes does not significantly contribute to work place transformation

Table 7

Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.577 <sup>a</sup>	.333	.327	.5807	.333	58.792	1	118	.000

a. Predictors: (Constant), Automation

b. Dependent Variable: WPT (DV)

Source: Data calculated by the researcher

Table 8

Analysis of Variance<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.827	1	19.827	58.792	.000 <sup>b</sup>
	Residual	39.794	118	.337		
	Total	59.621	119			

a. Dependent Variable: WPT (DV)

b. Predictors: (Constant), Automation

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.118	.197		20.893	.000
	Automated (IV) <sup>b</sup>	.389	.051	.577	7.668	.000

a. Dependent Variable: WPT (DV)

Source: Data calculated by the researcher



The R value ( $r = .577$ ) in Table 7 shows a moderate relationship between the automation & workplace transformation. Whereas,  $R^2$  signifies that workplace transformation is affected to the extent of 33.3 % by automation. Statistical results of ANOVA with p value ( $.000 < .05$ ) significance level signifies that the dependent variable (WPT) is significantly predicted by the automation in the processes with the regression

equation " $a = 4.118 + .389b$ ". This is in line with the critical research findings of Ipseeta Satpathy et al (2019) which depicts that use of technology increases productivity, makes task ease, bridges generational gap & helpful for work-life-balance.

*H03. Transformation at the workplace is independent across all generational groups*

**Table 9**  
**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	177.014 <sup>a</sup>	42	.000
Likelihood Ratio	102.498	42	.000
Linear-by-Linear Association	3.286	1	.070
N of Valid Cases	120		

a. 0 cells (0.0 %) have expected count less than 5.

The minimum expected count is 7.76

*Source: Data calculated by the researcher*

The analysis to investigate if transformation is independent across all generational groups Chi-square test (Table 9) was considered with p value ( $.000 < .05$ ). Findings of the analysis reveal that transformation is dependent across generational groups. Findings of cross tabulation signifies that workplace transformation becomes easier when a majority of the human capital forms Millennial workforce, however with gen X & Baby boomers, proper & effective training is required in order to bring smooth transformation at workplace.

## **FINDINGS & SUGGESTIONS**

The prime objective of the study was to find the role of technology to humanize the multi-generational workforce in building future workplaces. Results of the data analysis & hypothesis testing critically reveals the significance of technology in building future workplaces. Moreover, the presence of varied generations working together under a single umbrella & the increasing penetration of technological advancements compels the organizations to work towards improving the technological adaptability of the workforce.

The study also highlights that automated processes are contributing to the extent of 1/3<sup>rd</sup> (33 %) towards the workplace transformation which is a vital component & cannot be ignored. In a nut shell, the volatile, uncertain, complex & ambiguous business environment requires the multi-generations to be technologically sound & well-equipped to enable

them to deal with the challenges with higher confidence. The organizations are, therefore required to design training & non-training interventions for the people to develop themselves. Organizations must also develop a sense of inclusivity among all generations with a vision to grow together & achieve common goals of the business. Mr. Keshav R. Murugesh (Group CEO, WNS Global services, 2018) in his article pointed out technology as one amongst the largest contributor to work place transformation where the repetitive jobs will extinct giving way to new profiles which requires highly skilled personnel.

## **LIMITATIONS & FUTURE SCOPE OF THE STUDY**

The study has limitations with the sample data collected & can be performed on a larger sample base to gain more authenticity. Further, technology is just one contributor which is considered in this study in transforming future workplaces. However, there could be other significant contributors that may be considered for future researches.

The study has a huge scope in the future as workplace transformation is the need of the VUCA era & requires organizations to continuously delve in finding what defines future workplaces & workforce.

## **CONCLUSION**

The research was focused on defining future workplaces & the extent to which technology can be leveraged in humanizing the workforce. The collection & analysis of the data revealed interesting

results for the readers & signifies that organizations needs to look into developing technological competencies of their human capital & sensitize the people to utilize the dynamic hi-tech advancements to build & collaborate with each other & attain critical objective for the business. Further, the cognitive absorption of technology adopted by multi-generations will not be similar & therefore, be looked into as a non-training intervention where all four generations are encouraged to work together resulting in experiential & collaborative learning. The researcher would also like to highlight the concept of reverse mentoring to convert organizational learning into learning organizations.

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# Study of Freight Performance Improvement Parameter and Current Models

Uday Shankar Jha

## ABSTRACT:

*When Railways in India or other major countries are facing the situation of whether to be or not to be, there are consistent efforts to identify those parameters which provide better reasons for providing overall transportation facilities in the country. There are some features which evaluate whether any mode is performing efficiently or not. The purpose of this article is to identify what are those parameters which evaluate performance of Indian Railways in terms of overall delivery of services.*

When Railways in India or other major countries are facing the situation of whether to be or not to be, there are consistent efforts to identify those parameters which provide better reasons for providing overall transportation facilities in the country. There are some features which evaluate whether any mode is performing efficiently or not. The purpose of this article is to identify what are those parameters which evaluate performance of Indian Railways in terms of overall delivery of services.

Indian Railways plays a key role in the nation supply chain. The transportation of bulk goods is core strength of rail freight. These days, with growth of multimodal transportation in containers it provides a critical role of transporting containers of long distance destination, particularly of more than 700 km. Railways are more efficient on fuel consumption as it is able to move one ton of freight to 104.5 km in one litter whereas roadways is able to do it for 37.3 km only. Even railways are environmentally friendlier as these emit ten times lesser small particulate matters and fifteen time less nitrogen oxide than roadways. Therefore it is essential that rail freight should continue to prosper and to increase its market share in comparison to road. This could be possible only if railway should be in a position to offer qualitative and competitive services to its customers. This could happen only when railways have proper corridors in all critical areas with robust network for longer trains, increased axle weights with availability of 24 x 7 x 365 days with quality workforce supported by robust internet based up-to-date information system

## Objective

To undertake such study it would be relevant to enunciate the major objectives likely to be achieved through this study as this kind of study can point out several factors affecting the current freight operation working pattern, which are as under:

- 1) Improving freight transportation operation.
- 2) Providing additional freight capacity wherever there is economic viability.
- 3) Balance costs and benefits among all stakeholders of freight system to improve productivities.
- 4) Necessary corrections in statutory, regulatory and institutional barriers to improve freight transportation performance.
- 5) Proactively identify and address all factors to capture greater share of transportation.
- 6) Maximize the safety and security of the freight system to make it more attractive.
- 7) Mitigate and better management of the environmental, health, energy, pollution and community impacts of freight transportation and
- 8) Better utilization of public resources for public good.

## Measures

To achieve above objectives, the major proposed initiatives could be as under:

### Average Speed

Average speed of Indian Railways Freight Wagon track km per day is only 11.8 km whereas average speed of Mail Express train is 50.2 km. Such low



speed leads to longer duration in end to end journey and becomes a very critical factor in its performance. End to end journey time of freight flow in some key busy corridors could be very long and average speed could be even lower. This restricts railways ability to offer a competitive service and price to its customers. The main reasons for longer journey time is capacity of the existing infrastructure and available path where there are lesser crossing or preference of other trains. Lower maximum permissible speed of the section and huge number of permanent speed restrictions leading to overall low sectional speed are another factors.

To improve the freight performance parameters, certain steps are required to improve the line speed capability. This may include steps for increasing the maximum line speed on a given route and reducing the number of permanent speed restrictions which would remove various sections of low speed. Those permanent speed restrictions are more critical which are on lower side like 15 kmph to 30 kmph as once the speeds of freight train is reduced to 15 kmph then it takes very long to resume the average speed of 50 or 60 kmph. By taking suitable corrective action there could be improvement in track profile which can increase the average speed of freight services. Once it is achieved, then there would be improved shortest journey times, enhanced service levels to end customers, reductions in operating costs and increased network capacity. Increasing line speed for freight trains from 60 kmph to 75 kmph or 100 kmph would enable journey time improvement. Subsequently, freight services can run similar to passenger services at higher speed. This would lead to increase sectional capacity. Ultimately these improvements would lead to reduction in operating costs by reducing loco pilots driving time and capacity utilization and better availability of assets.

It may be noted that before undertaking any steps to increase the sectional speed it is more important to remove all permanent speed restrictions as even if maximum speed of section have been improved and if existing speed restrictions in slow section continue then average speed would not improve. Such speed restrictions reduce service quality and increase running times. Due to need of continuous reduction and increase of speed leads to more fuel consumption and more wear and tear of rolling stocks. Hence removing existing speed restrictions should be highest priority item to facilitate to increased average speed. Once this is done then only any exercise to upgrade the sectional speed should be undertaken.

#### **Length of Train**

In railways there is an opportunity cost to run a train which is known as path. If railway is able to run more number of wagons in a train it saves another path. If

railways are able to carry a greater volume of goods per journey it provides an edge over other modes of transportation. However, if the length of train is restricted due to infrastructural limitation, this advantage is gone. These days light goods trains, primarily intermodal trains are main beneficiaries as both double stack containers or double length trains as these can run with existing locomotive power. In comparison heavier commodities like coal, minerals or food grains need higher traction capability of locomotives and coupling strength. Till the present time appropriate solution for these problems are yet to be developed.

For longer length trains of 1400 or 1500 meters, another primary requirement is long loop or cord line to accommodate these trains without affecting trains on another track or blocking level crossing gates near any station, where trains might have stopped for crew change, fuelling or any other such reasons.

The solution to overcome the restriction of train length is to identify all such routes where it is contemplated to run such services. Under this for running double stack trains there is need to identify all Foot over Bridges, road flyovers, signal posts, other service buildings which are likely to hit the double stack containers. For long length train there is need to develop double length loop line at several stations along with stabling facilities along with clubbing and de-clubbing yard.

#### **Weight Restrictions**

With improved technology now wagon manufacturers worldwide producing higher capacity wagons which have higher axle load. In Indian Railways in high density route of CC+8+2 tonnes maximum permissible tonnage is only 22.9 tonne. However, in newly being developed Dedicated Freight Corridor (DFC) - a separate line being developed by a Corporation of Indian Railways is 25 tonne. To accommodate such type of wagons, a restrictive speed of 45 KMPH has been proposed to be imposed.

It may be noted that increasing the axle load of track is one of bigger decision as this has a huge cost implications for upgrading the existing track. In this for 60 kg of higher ultimate tensile strength rail, a wider concrete sleeper along with new liner, rubber pad and elastic rail clips are required. These items would need an investment of Rupees Two crores per kilometre. Still enhancement to sectional speed of lower speed territories which are imposed due to higher axle load restrictions may lead to improved average speed by removing various speed restrictions. Such positive action may give benefit of higher speed. Up-gradation of points of loop line from 15 KMPH to 30 KMPH is an example of such changeover.

#### **Electrification of Entire Route**

Presently, Indian Railways have mixed traction

system. In some important busy areas electrification has been done whereas in many areas, particularly branch line and side lines diesel locomotives were the prime movers. However, in recent time, a massive drive for electrification is going on in Indian Railways. It is expected that electrification is going to help freight traffic in a big way. Since electric traction power is more capable to handle heavy load hauling as it can multiply its traction effort in critical areas by drawing more power through electricity grid which is not possible in diesel traction. It means freight loads with electrical locomotives are likely to reach faster to its destination. This would give all added advantage of higher speed i.e. faster delivery to the customers, less transit time and better utilization of resources. Overall electrification leads to increased network capacity, improvement to capacity utilization and network efficiency and overall reduction in whole industry cost. Environmentally, electrical locomotives are much better than diesel locomotives.

However, to get these benefits of electrification there are certain conditions. Firstly, all lines of major stations, loop line, yard line, sidings line etc., are to be covered with electric installations. This should also include all private sidings, public goods sheds, shunting lines etc. Secondly, there should be sufficient arrangement for power supply and distribution. Thirdly, there should be proper arrangement of round the clock uninterrupted power supply system. To get optimum benefit, even passenger services running on same line should be fully covered and sufficient number of electrical locomotives with appropriate traction power should be available. "Last mile" capability for electrical traction to run into the terminals is also essential. A proper mechanism to handle loading, unloading, terminal, pit lines etc are also required to be developed

#### **Digitalization of Indian Railways**

Like any other section, Indian Railways have also great potentialities for reaping the benefits of digitalization of entire activities including infrastructure, train operations, capacity allocation etc. This requires accelerating the entire activities of digital enablement of the railways. Through advanced signalling system, additional capacity to run the train can be generated by reducing the headways. Stocks can be better utilized with live monitoring of the flows of entire operation. Similarly, train operation could be optimized to time with passenger services and movement of freight rolling stock as per demand. A few additional freight paths can be generated due to digitalization. Even safety of railway can be improved by better monitoring of equipment failure and live monitoring of maintenance pattern. Real time digital monitoring of all passenger and freight trains can

indicate whether trains are running at optimal speed or under speed. Such monitoring can increase the sectional capacity. Digitalization of even yard can help in better utilization of assets and running of train as per available path.

However, merely digitalization may not prove to be beneficial until all related information are interlinked and a close monitoring system is developed to know and attend the deficiencies and act on available resources available for optimization. There is need to activate fully functional Management Information System (MIS) for these purposes.

#### **Development of Model Yards**

In the present working system of freight operations of Indian Railways, nature of fleet flow - wagons and locomotives is nomadic on the basis of demand. Looking to sub-continental size of country, Indian Railways is required to identify critical location of model yard which can be used for stabling, carrying out different periodical maintenance and clubbing / de-clubbing for formation of train and supply of wagons to customers and taking it to destinations. Thus model yard works as inventory point for wagon supply in its nearby area. It can also work as crew changing locomotive fuelling and waiting space for giving path to passenger services or other preferred trains. At some critical yards even full trains examination facility including various periodical maintenance facility can help in reducing empty wagon running for examination. To obtain full benefit entire information should be fully digitalized. Overall purpose of nodal yard is to achieve shorter overall journey times for customers by reducing or eliminating multiple stops or routes.

However, if model yards are not properly planned at centralized location, it can prove disastrous and like a graveyard. All associated facilities being developed should be based on pure requirement of freight services and there should be maximum utilization of these services. Otherwise establishing these facilities have huge sunk cost with heavy implications on the working of organization.

#### **Changing Attitude - Customer Oriented Railways**

During initial years of 20<sup>th</sup> century most surface transportation was done by railways.. However by middle of 20<sup>th</sup> century scenario changed drastically, when road transportation became more popular. Road facilitated end to end transportation, whereas any other mode including railways necessitated additional transshipment along with pick up and finish journey by road. This leads to higher cost and longer duration to the customers. Such additional handling affects customers' logistic costs and line of service. Further, most railways in emerging countries including India were developed to move bulk cargo mostly minerals

and raw materials to port or market or factory during late nineteenth or early twentieth century. At that time it was carrying almost 80% of freight transportation. But by mid twentieth century their share kept falling below 50 percent as most government railways, including Indian railways have failed to meet customers' expectation and needs. Such situation leads to shift of customers from railways to roadways. In this environment even bigger customers with the requirements of bulk movement for long distances are opting for road movement. In such depressive situation, railways worldwide have faced the crisis of decreasing demands and increasing number of staff with little efficiencies, insufficient cash on hand or little money for future investment for improvement and became inward looking instead of customer oriented organization. Since funding came from public sector, railways were strictly controlled for price and services and priority was given for passengers amenities neglecting freight related facilities.

#### **Transportation of Railways as Multi-Model Service Provider**

These days' customers desire end to end service and they are least interested that which mode is being used. In developed countries, in transportation field the focus is on improving operation efficiency and taking a holistic view from the perspective of transporters, freight forwarders and third party logistic providers. These days importance is being given on reliability of services, price, travel time, flexibility of service, security and due control over system is important. With growing size of cities and lack of storage spaces, increasing congestion and attempt to cut the inventory size to reduce production cost, popularity of just in time concept is increasing. In such market, time sensitive freight categories, customers place reliability above price, and here even fastest and least expensive transport service would not be attractive if it is not reliable. In this context, if railways claim that it would provide cheaper transportation without relating other factors including reliability may not translate into more customers. For railways to be part of a holistic logistic service provider, rail organisation need to cultivate a reputation for efficient, competitive and reliable service provider. In this scenario, railways may take a lead role to develop a strategic partnership with trucking companies and contract with logistic providers and adjust their service offerings to facilitate the logistic chain. For this railways may identify specific need of the customer in view of commodity, distance and nature of traffic. If the commodity is bulk or export or fast moving consumer goods and for short distance or long then strategies to deliver the produce would be separately and specifically developed incorporating all modes of transportation. So the

logistic requirement for of moving low-cost heavy weight mineral from mineral areas to factory or nearest ports is entirely significantly different from the other ends of wholesale traders or customers who wants their different industrial products to be delivered in smaller quantity at multiple locations. Such task could be achieved, not single handed by Railways itself, rather it has to associate various service partner for various subsidiary activities where truckers, terminal manager, loaders, un-loaders and various other service providers play active role as per clear cut defined Memorandum Of Understanding (MOU) to achieve higher customer satisfaction for end to end services. In this scheme, railways should try to carry only those commodities and distances where it has competitive advantages. As such it may be noted that railway transportation can be beneficial only when stream of traffic is consolidated at one place to get critical mass or sufficient quantity to move longer distance. To achieve this at outskirts of bigger cities logistic park cum railway yard may be developed, where different commodities can be aggregated by bringing through road and dispatched through railways to other major cities. This could be done only when sufficient quantity has been accumulated within a reasonable period of time. For this there would be requirement of of coordination with central government, state government and local authorities to develop such place as multi-model estate.

To make functional such integrated system, critical hub must be created to consolidate and generate sufficient large volumes of freight. Ideally, near a bigger city or metropolitan town one model yard with all ancillary facilities including proper road access can work as such hub. Overall the survival question for railways is to ensure rail component in door to door logistic service provision. To achieve this either railways should start doing these things itself or involving other specialised companies as service partner with full responsibilities

#### **Resolving Statutory Regulatory and Institutional Barriers:**

To overcome the present restrictive capacity problem of Indian Railways, a whole set of new statutory and regulatory framework is required, as in present framework the percentage share of Indian Railway in overall national transportation framework is gradually reducing from 80% in 1951 to around 20% in recent years, although IR has loaded much bigger quantity than 1951. In present set up the day-to-day business controlled by policy issued by the Railway Board, overall ratings of transportation charges i.e., price and movement of wagons are controlled at apex level. There is no system of full flexibility of performing business purely on local demand and supply system. Nor there is system of increasing or decreasing rate as



per local condition. There is no system of offering any discount on day to day basis at local level. Nor the supply of rolling stocks is chargeable on cost based to the local unit. Even the availability of track capacity is not based on day to day price and costing. In present framework, availability of track capacity is on consolidated pattern where no significant increase in track capacity can be done even if there is higher demand. Looking to huge sunk cost and long gestation period of railway assets such capacity cannot be increased or decreased on day to day basis. In such a condition an entirely different institutional framework is required to be developed where entire spectrum of capacity services should be available on cost basis whereas supply of transportation facility should be purely based on demand and supply at local level. Since such changes cannot be done in one go, so initially a hybrid modal may be developed to consolidate the working pattern.

#### **Long Term National Transport Planning**

In India, although Niti Ayog is taking a lead and responsibility of national planning, a focussed attention on transport planning is required where a higher importance on provision of substantial additional capacity generation on all major routes within a relatively shorter time framework for railways is required to be done. Although the project of Dedicated Freight Corridor is under implementation on two major routes; Mumbai-Delhi and Delhi-Kolkata for last fifteen years, such capacity addition is required to be done for at least twenty more such routes in short time framework of two to three years. Despite, being a gigantic task, such visible action is essentially required to be undertaken to establish a model balance of national transportation. Until such challenging task is initiated and completed the nation cannot gain a real benefit and only marginal benefits may be achieved here and there. It may be noted that over the period of time road sector has seen exponential growth over railways. If this trend continues then very soon roadways will completely takeover and railways would be completely wiped out. Unlike roadways, in railways the operator has to also bear the entire cost of maintenance of track. This makes railways a costly affair for the operator. Since Railways has several associated benefits in terms of higher fuel efficiency, less poisonous gas pollution, sound pollution, lesser level crossing related accidents, lesser collision and other accidental deaths etc., along with high efficiency in handling traffic in congested area there is national need to promote a model balance between railways and roadways. In many bigger cities and metropolitans, railways can provide much better transportation solution than roadways. Hence, national policy planner on

transportation should take a call on this issue and they may decide to provide several benefits and incentives to propagate railway-based transportation system.

Since railways are most safe and secure mode of transportation, it would be prudent to take a call for the benefit of national economy but also for society and environment. As such there is no single model to improve parameters of performance of railway's working. Rather this is a very complex situation where several parameters have to be associated to develop a model mix to derive a better result. Certain measures discussed in this article like increasing average speed, increasing length of train, improving weight limitations, more electrification, developing model yard and greater digitalization for optimum use of resources can provide real benefit only when railways changes its attitude for provision of total logistic solution which should be supported by statutory, regulatory framework and institutional mechanism and backed by solid long-term national transport planning by real action translated on ground by making these additional capacity actually available for model balance. Once it is done in holistic manner, then only the desired objectives can be achieved.

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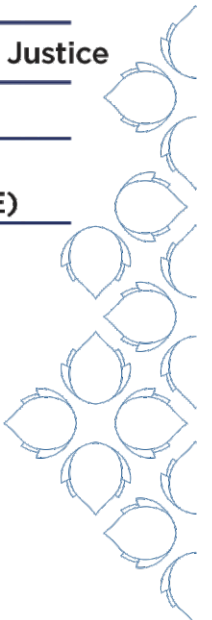


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